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LIEUT.-COL. T. ST. LEGER ALCOCK, Vice-President, in the Chair.

A SKETCH OF THE MILITIA, PAST AND PRESENT.

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The CHAIRMAN.—Ladies and Gentlemen, I am sorry to have to announce that the distinguished Officer who was to have taken the Chair upon this occasion is unable to attend, and that it therefore becomes my duty to take his place, however imperfectly I may be able to do so. I shall now proceed to introduce Mr. Marshall Hall and request him to commence the lecture which he has promised on the subject of the Militia.

Mr. MARSHALL HALL.—I appear before you, begging your indulgence; for, prepared as I was with a short paper embodying my views upon subjects connected with militia, I confess that in consenting to lecture instead of reading the said paper, I put myself in the position of having to add other matters to what I had purposed to say; and also, instead of my ideas being merely a contribution, leading to a general discussion, in which they would stand or fall according to the degree of their merit, by putting them into the form of a lecture I appear in the constructive position of keeping many senior Officers of far more knowledge and infinitely more experience than myself to listen to the lucubrations of one whose only claim to their attention is, that he has devoted much time and earnest thought to what he now ventures to say.

First, I propose to glance in a very cursory manner at the reserves of several European nations, namely, Denmark, Sweden, and Switzerland, for the purpose of comparing their systems with our own. After

this we will glance at the history of British defensive organization, see on what points we may profit by the experience of the nations before-mentioned, and whether, as far as possible without materially increasing the burthen either of expenditure or service, we may add to the efficiency of our reserve.

There are, so far as I see, three ways of supplying the necessities of military defensive service. The *first*—an old feudal system—was to make the *land*, through its owners, responsible for the forthcoming of a certain force.

The *second*, which is still the law of this country, though suspended annually by a vote of Parliament, is *conscription*, or, in other words, *ballot*.

The *third*, and by far the noblest way, is by *voluntary enlistment*, and I think it the great glory of old-England that such is, and is likely to continue to be, the British system of our day.

Where the great bulk of the male population is liable to serve, there are two modes of supplying the forces. One is that each shall serve in turn for a limited period; the other, that from the number liable, a selection be made. And, however provided for, there are also two modes of giving that service—one continuously, the other for shorter times spread over a longer period.

Now, in Europe we have at the present moment, each of these systems of supply, in full force. It may be wondered why I should select such comparatively limited armies as those of Sweden, Denmark, and Switzerland for my sketch. My reason for so doing is simply this: that in Sweden we have the type of the old feudal military tenure, the service being due to the Sovereign and not to intermediate lords; in Switzerland we have the whole male population taking it in turns to serve; and in Denmark we have the liability of all to serve, but a selection, ballot, or conscription as the practice.

I have also chosen those countries because in all three the government is a constitutional one, and it is safer to draw any conclusions applicable to this country from the practice of such, than from the systems of nations which, like Austria and Prussia, can hardly be said to be in that position.

To begin then, Gentlemen, with the oldest form of service, I will sketch the Swedish organization:—In ancient times, in all Scandinavian countries, armies and fleets were raised by imposing upon certain districts into which the land was divided, the obligation of furnishing in time of war a certain number of men, or of ships; which obligation was permanent and considered a part of the regular burdens upon the citizens for the maintenance of the State. In Denmark and Norway this has long been completely abolished, but in Sweden it still exists, modified and re-organised in the 17th century; and this is the fundamental principle of the Swedish militia, or "Inddelta Armeen," that is, "The Divided or Distributed Army."

The details of this institution are somewhat complicated, but its main features are the following:—

Besides a small standing army of about 6,000 men, resembling, in all respects, those of other countries, the Swedish Army consists of

a number of local regiments, amounting in all to 20,000 men, who always live in their own neighbourhood, and are maintained at the direct expense of the inhabitants. There is some difference in the arrangement with regard to the cavalry and the infantry. We will consider them separately.

I. Cavalry.

Throughout the southern provinces of Sweden are found a number (7,600) of farms or estates, each of which is obliged to keep always ready, in peace or in war, fully equipped and well mounted, *one cavalry man*, dragoon, chasseur, or hussar, as the case may be. The owner of the estate is bound to give this man for his use, as long as he remains in the service, a house, and a couple of acres of ground or more, so that he may keep a cow or two and some sheep. Besides this, he gives him a bounty, once for all (generally a few pounds sterling), and annual wages—all according to private contract. The owner of the estate must keep and feed a horse, which generally costs about £10 or £15 to buy, and likewise keep the man fully equipped with arms, accoutrements, uniform, and, in short, everything necessary. Once a year the houses, men, horses, equipments, &c., are inspected; and there are regulations for the condition of everything. The soldier remains a soldier as long as he is capable of serving; when he dies or becomes unfit for service, the owner of the estate must provide another, except the man should be killed in war, when a new one is provided only with the return of peace. The horse also, even in time of war, must, if killed, be replaced by the owner of the estate.

These men form local regiments, varying in strength from 400 to 900, which are mostly named after their province.

These cavalry regiments are rarely appointed to garrison service in time of peace, and are never employed upon public works as the infantry often are.

For every regiment and every squadron there are fixed *rendezvous*, with arsenals, barracks, riding-houses, &c. At the meeting places of the squadrons, all the new horses and the recruits assemble every year for practice during three or four months, between February and May.

Similar general drill meetings are held annually by every regiment, at the "regimental camps," in the spring, for from 6 to 14 days.

Every third or fourth year several regiments meet in some place or other, for practice and inspection.

The support of the men when they meet for practice, or in time of war, is generally paid by the Crown; but the owner of each cavalry farm must pay a certain annual sum towards this expense.

Every owner of an estate on which this duty is incumbent, enjoys a remission of his taxes to the Crown—a sum which sometimes exceeds the cost of keeping the man. In some cases the duty of keeping a horse has been remitted, so that, in fact, the man kept, is an infantry soldier; and in other cases the landowner has been allowed to commute this obligation altogether for the payment in full of taxes. The

consequence is, that although there are 7,600 such farms, the force of this cavalry really amounts only to 3,300 men in 6 regiments; 5 other regiments, originally cavalry (3,500 men), being now converted into infantry.

II. Infantry.

With the exception of the farms and estates bound to keep cavalry, nearly the whole of the landed property throughout Sweden is divided into what are called *rotes*, comprising from one to four farms, or—where the farms have been subdivided since this institution was last regulated—even a greater number of homesteads. Each of these *rotes* is bound to keep constantly in readiness, both in peace and war, *one man* to serve in the infantry, or in some cases in the navy, as long as he is fit for service; when discharged on account of age, or for any other unavoidable cause, he receives a small pension.

As long as he remains in the service, he has the use of a house and ground, like the cavalry already described; and he also receives a bounty and annual wages by private contract between himself and the members of the *rote*. Generally one member of the *rote* is answerable to the Crown for the supply of recruits.

The *rotes* bear only half the expense of the uniform, the other half being paid by the Crown, as well as the whole cost of arms, ammunition, &c.

The recruiting is similar to that already described in treating of the cavalry, and, as in the latter case also, the *rote* is not bound to replace a man wounded or killed in war. In three months after the conclusion of peace, they are, however, called upon to fill up the vacancies, which are temporarily filled up from a reserve, to be described presently.

I may here observe that the *rotes* have no remission of taxes on account of this military burden.

The men last spoken of, form local regiments, which hold annual meetings for drill at the *rendezvous* of companies and regiments within their district, similar to the cavalry; but the recruits are kept to drill a shorter time, as there are no horses to train, and no horsemanship to learn.

The cavalry regiments not being required to do garrison duty in time of peace, this obligation is imposed on the infantry regiments by turn, a part only of a regiment being called up at a time. Of course this gives increased opportunities for drill. Their keep when on duty is defrayed by the Crown. Formerly the *rotes* paid a portion, but they are now exempt from this burden.

There are 19 regiments of this infantry, named after their respective provinces, 12 of them consisting of about 1,000 men, the others being somewhat weaker; in all, 16,800. The five old cavalry regiments which are now infantry, make 3,500 more; so that the actual strength of infantry is 20,300 men.

As already stated, some of the *rotes*, near the great sea-ports, are bound to furnish sailors, amounting in all to 5,700, who likewise are

ready at a moment's notice, and do duty in the arsenals and on board ship by turns.

A reserve for this army is formed in two ways—partly by the old burden being extended to newly-formed homesteads in places formerly uncultivated; partly by the so-called "Beväring," about which a few words should be added.

The fact is, that over and above the burden of keeping soldiers and sailors, as just described, every male individual between 20 and 25 years of age, not physically disqualified, is bound, if called upon in time of war, to do duty for the defence of the country, as the Government may order.

This reserve, making every deduction for infirmity and other causes of exemption, amounts to 100,000, divided into five classes, according to age. Every year the youngest class, amounting to 20,000, is called out for military service. A portion of these, who are registered at conscription sessions held every year, are put down for service in that local infantry regiment of the "Distributed Army," which is stationed in the home province of the conscript. Thus these regiments can be made stronger than they would be if composed only of the men kept by the *rotes*. They are partly used to fill up vacancies in time of war, and some portion of them serve to form separate regiments. The young men in the twenty-first year of their age meet only once for a fortnight's drill, this being all that is required of them in time of peace. After attaining their twenty-fifth year they are free from further liability to serve.

The cavalry regiments consist of from 5 to 10 squadrons of about 100 men each. Every squadron is divided into 3 corporal's commands of 33 or 34 men each, including the corporal.

The infantry regiments have 2 battalions and 8 companies of 150 men, the latter being divided into 6 corporal's commands. Some are, however, only half regiments, making only 1 battalion.

The corporals, both of cavalry and infantry, are taken from amongst the men, and live as the men, having a house, &c. Indeed, the men are promoted to the grade of corporal, and then receive extra pay from the Crown, besides their private contract with the *rote* for which they serve.

Originally all the officers, subalterns, civil *employés*, even the chaplains, the drummers and trumpeters, had houses and farms in lieu of pay, all these farms, &c., being situated within the district of the regiment. At present such fixed abodes are provided only for a certain number of the officers, the other farms and houses originally destined for this use being now let, and the revenue, together with certain other revenues, collected into a fund belonging to each regiment separately, out of which those officers, to whom houses are not given, receive their pay, supplementary pay also being given to those officers who still are provided with residences. Houses and farms are provided for commanders of regiments, majors, commanders of companies and squadrons, the ensigns, and 2 serjeants per company; in the cavalry 3 serjeants per squadron; and finally for the clerks and accountants. All the others are paid in money alone, but are bound to

live within the district, so that the regiment can, without delay, go directly from its home, fully equipped, to the seat of war or wherever ordered, at a very short notice.

Cadre of a Regiment of Infantry complete—8 *Companies*, 1,200 *men.*

1 Regimental Commander 3 Majors 1 Quartermaster 2 Adjutants (Regimental) 2 Adjutants to the Battalions	The Staff.

8 Captains—Commanders of Companies.
2 Sub-Captains.
24 Lieutenants.
8 Ensigns.
12 Sergeants.
16 Second Sergeants.
48 Corporals.
40–50 Drummers, Trumpeters, and Musicians.

1 Chaplain.
3 Surgeons.
4 Clerks.
1 Auditor (that is, a Barrister, as officiating Judge-Advocate).
2 Armourers.
1 Intendant.

Cadre of a complete Regiment of Cavalry of 10 *Squadrons*—1,000 *men.**

1 Regimental Commander.
2 Majors.
1 Quartermaster.
2 Adjutants.
1 Master of the Stable.
10 Captains Commanding Squadrons.
2 Second Captains.
24 Lieutenants.
10 Ensigns.
30 Sergeants.
30 Corporals.
31 Trumpeters and Musicians.
10 Veterinary Sergeants.
3 Surgeons.
1 Chaplain.
1 Auditor.
3 Clerks.
1 Saddler.
1 Pistolmaker.
1 Intendant.

* There are but 2 complete regiments, the other 4 are only half regiments.

The status of the Swedish army is, consequently, as follows:—

The General Staff The Topographic Corps The Engineers The Artillery	Recruited by enlistment, as in England	3,000 men.

THE CAVALRY.

7 Regiments and Corps.		
2 ordinary enlisted Regiments	1,100	,,
5 of the "Distributed Army"	3,300	,,

THE INFANTRY.

27 Regiments and Corps.		
3 enlisted Regiments and Corps	2,450	,,
24 Regiments and Corps of the "Distributed Army".....	20,300	,,
	30,150	,,

besides the general reserve of 100,000 men.

In time of need a few additional regiments are sometimes raised by increasing the "Distributed Army" in this way—that an extra soldier is required of, say every three or every five *rotes*, which must share the expense among themselves; but this is rarely resorted to.

The 5,700 sailors furnished for the fleet by the *rotes* in the districts near the sea-shore are generally sufficient to man the fleet. Mariners are obtained by common enlistment.

The Danish army, it will be seen, is supplied much as our militia would be, but for the annual suspension of the Ballot Act.

At the age of 22, every one has to meet at the session of conscription; students, in order to complete their studies, may postpone this till they are 25.

They are sorted for different arms; those who are very short-sighted or otherwise disabled are altogether rejected. The smallest, but otherwise strong, are put to train, and never called up in time of peace. Those of middle size, are taken for infantry. Artizans are generally taken for the artillery or engineers. Those above 65 inches Danish (nearly 67 English), are taken for cavalry, if accustomed to horses; 69 or 70 inches (6 feet English measure) for the Guards. Every regiment of infantry and cavalry obtain their men always from the same locality. But, of course, as those fit for cavalry are comparatively much fewer, four or five districts, which furnish each a battalion of infantry with conscripts, can furnish only one regiment of cavalry at the same time.

About 40 per company, that is, in each battalion only 160, are actually called upon to serve in time of peace. Those who are not called to serve

in peace are not required to drill, unless war should supervene. Those who are called upon to serve do so for 16 months (so that in summer, from May to August, there is a double complement under arms), and after that, for a certain number of years, they form, together with those who are their contemporaries, but had not been actually called up for service, the *reserve* of the battalion, which is called up in case of need. If all are called up, each battalion will receive more men than are needed to make its number up to the war complement, which is 800 (200 per company), and the battalion is then doubled, that is, a new battalion is formed of the superfluous numbers, and the officers of the original battalion, in part, transferred to the new; officers of the reserve being called up to supply deficiencies. The 2 battalions then form a regiment, so that each brigade, instead of 2 or 3 battalions (see below) gains 2 or 3 regiments, that is, from 4 to 6 battalions.

When a man has been in the reserve—whether actually called up or not—a certain number of years, he is transferred to a second reserve, which is not based upon supplies from any particular regiment or battalion, but from the army at large, and which, of course, comprises a great many married men. Sometimes they are ordered to fill up vacancies caused by battle or illness, sometimes formed into entirely new regiments.

In the cavalry and artillery the system is analogous.

The Guards are picked from the whole country.

Officers by profession obtain their commissions only on examination, which is the same for all; and no new examination is required on promotion. This goes regularly by seniority, and in this respect all in the same arm form one body, so that a vacancy, for instance, in the 16th of the Line may benefit an officer in the 4th if he comes next in seniority, &c. Seniority counts from their first commission as lieutenant, and as many pass their examination on the same day, or rather finish it on the same day, their seniority amongst themselves depends on how many marks they gain. The cavalry has its own list for promotion, and so, of course, the artillery and the engineers, in which, consequently, it is slower than in the infantry, and the pay is, on this account, a little higher. Those who wish to become engineers must pass through a special military school, where the science of engineering is taught, and where a very high standard is kept up; so that the examination for a military engineer is counted as one of the most difficult of all examinations in Denmark. If an officer, having passed this, wishes to be placed on the general staff, which is reserved for those who pass with the highest marks, and depends on whether there is a vacancy, he must serve for one year in each of the three arms—infantry, cavalry, and artillery, before he can be appointed to the staff.

In some cases promotion goes by merit without strict adherence to seniority, particularly in appointing to the command of a battalion or regiment.

Reserve officers are very rarely promoted to the rank of captain. When it is desirable to promote them to captains, they are made officers of the line.

Non-commissioned may become commissioned officers; but this is rarely the case.

Non-commissioned officers of the first class—serjeants—enlist for eight years, after which period they are entirely exempt from any military service. They generally become substitutes for conscripts who do not wish to serve, for which they receive from £80 to £120, whereupon they renew their engagement as non-commissioned officers. The individual who sends such a substitute, entirely changes places with him, and liberates himself from all obligation whatever. In one case, within my own knowledge, a gentleman, distinguished in diplomatic life and in literature, procured a substitute, ten years ago, for £140. His substitute had served as a non-commissioned officer for eight years, otherwise my friend would have been called upon to serve in the late war. He might at the time have procured a substitute for less money, viz., a man from among his own contemporaries who had not been called up for actual drill as he had been; but that, of course, would not have freed him in time of war. Of course it happens in time of danger that persons who have thus freed themselves, nevertheless take part in the war as volunteers.

The non-commissioned officers of the second class—corporals—are mostly picked from among the recruits of each year, and are kept two years to duty; they are then only liable to assemble in case of war.

It was found, during the late war, that there was too small a number of officers, commissioned and non-commissioned, and this was particularly the case in the artillery. There was also a deficiency in the number of experienced gunners, a necessary consequence of this system, by which let us in England not fail to be warned.

LIST OF OFFICERS OF THE DANISH ARMY.

I. The General Staff.

1 Colonel.
3 Majors.
5 Captains, 1st class.
6 Captains, 2nd class.
Clerks, &c.

The Staff manages the survey, and the Captains serve in time of war as *sous-chefs* and adjuncts to the Commanders of Brigades, &c.

II. The Engineers.

1 Colonel or Major-General, as chief.
2 Lieutenant Colonels.
2 Majors.
13 Captains, 1st class.
3 Captains, 2nd class.
12 First Lieutenants.
6 Junior Lieutenants.

Several Clerks, Draughtsmen, Local Inspectors of Fortifications, &c.

The Engineers have the management of all the Fortifications, the Pontoon Trains, and the Government Roads.

III. Artillery.

1 General, as chief.
2 Colonels.
4 Majors.
18 Captains, 1st class } (merely a difference in pay).
14 Captains, 2nd class }
22 First Lieutenants.
9 Second Lieutenants.
Clerks, &c.

The Captains command batteries (of 8 guns each), assisted by a Lieutenant.

IV. Cavalry.

1 General, as chief.

1. *Lifeguards* (only for service in the Palace).

1 Major.
1 Captain.
6 Lieutenants.

2. *Hussars* (only 4 Squadrons or 1 Regiment).

1 Major.
4 Captains, Chiefs of Squadrons.
1 Captain, Chief of the School.

3. *Dragoons.*

4 Regiments, each having:—
1 Commandant (Major or Lieut.-Colonel or Colonel).
1 Major, Second in command.
4 Captains, Chiefs of Squadrons.
1 Captain, Chief of the School.
13 Lieutenants, one of whom is Adjutant.

V. Infantry.

1 General, as Inspector-General; 2 Junior Officers serve as Adjutants.

1. *Lifeguards*, one Battalion of 4 Companies.

The King is chief.
1 Colonel.
1 Major.
4 Captains (Commanders of Companies).
1 Captain, for the Schools, &c.
13 Lieutenants, of whom about two-thirds are First Lieutenants.

The rest of the infantry is divided into 8 brigades, consisting in time of peace, of 3 or, sometimes, only 2 battalions each.

Each brigade has a chief (general or colonel), with an adjutant.

There are now 22 battalions, of 4 companies each, and the following officers:—

1 Commander (Major or Lieutenant-Colonel),
4 Captains,
12 Lieutenants, on an average.

They have now the following officers of the reserve who receive a sort of half-pay, but are not constantly on duty, and are not officers by profession:—

In the artillery, 36 Lieutenants.
„ „ cavalry, 20 Lieutenants.
„ „ infantry, 5 Captains.
„ „ „ 348 Lieutenants.

In time of war they would be instantly available.

The last foreign system of defensive organization with which I shall trouble you is that of Switzerland, a country which has for centuries presented the edifying spectacle of a nation determined to be independent, but never interfering with its neighbours—in fact which has minded its own business, and minded its own business only.

The organization of the Swiss army was entirely revised in 1850 and 1851. Amongst other sources of information I am indebted to the "*Essai sur l'Organisation Militaire de la Suisse*," by Lieutenant-Colonel Mandrot, of the Federal Staff.

With the exception of the clergy, and of certain functionaries, employés, and so forth, every Swiss is a soldier. The term of his service extends from the age of 19 to that of 44.

The army is composed of the *élite* and the reserves. The Swiss are liable to serve in the former up to the age of 34. But, practically, a man passes into the reserve at 28 or 30, and remains in the reserve till he is 40, after which he passes into the *Landwehr*, which may be termed the second reserve.

Lieutenant-Colonel Mandrot calculates the whole force—organized, armed, and equipped—at one seventh of the whole population.

The cantons contribute contingents according to their importance, in money and men. The War Department of the Federal Council appoints the superior officers and staff, whilst the cantonal appointments are confined to regimental officers. The instruction of troops is divided between the federation and the cantons. The former takes charge of the engineers, artillery, cavalry, and riflemen; the cantons teach their infantry, and also the rudiments of drill to the other arms. Infantry recruits have 28 days' drill, at the least; engineers and artillery 42 days; and riflemen 35. After that, the annual duration of drill is only a few days for infantry, and about a fortnight for the special arms.

They have a military school at Thun, to which they send staff officers

—even a Lieutenant-Colonel on his promotion to Colonel. To assist in their instruction, they call up a brigade of the contingent, which executes military movements, takes up ground, and, in fact, the school becomes a camp of instruction.

Aspirants for commissions are sent to other schools at Soleure and at St. Gall, and recently appointed officers are sent to Thun, so as to insure uniformity of drill throughout the cantons.

We may draw three conclusions from this system, viz.,

That the Swiss take care to have their men well officered;

That they work their army at very small cost;

Also, that it is an army only fit for home service, since it is drawn from all classes, including those in which individuals can least be spared for protracted service.

The Swiss take up a formation, and execute manœuvres with great intelligence; while skilled riflemen, whose renown with their weapon is world-wide, form no less than one-tenth of the whole army.

That they can fight well, history abundantly shows.

I have now sketched the means of defence of my three types. Before we proceed to consider our own, let me quote two or three passages respecting the percentage of the population forming the armies in some other countries.

The French Emperor, in his "Life of Julius Cæsar," vol. i, p. 13, says:—"80,000 hommes, en état de porter les armes représentent, suivant la statistique actuelle les 55 centièmes de la partie mâle de la population, soit 145,000 hommes, et pour les deux sexes, en les supposant égaux en nombres, 290,000 âmes. En effet, en France, sur 100 habitants, il y en a 35 n'ayant par dépassé l'âge de 17 ans, 55 âgés de 17 à 60 ans, et 10 âgés de plus de 60 ans."

The French army is said, according to the *Moniteur de l'Armée* of July, 1864, quoted in the *Times* of May 8, 1865, to receive a contribution of 100,000 recruits every year; each man serves for seven years, and therefore seven conscriptions (the necessary deductions being made) constitute the army—generally stated at 600,000 men. It has been put at 420,000 under arms, the complement of the effective army being in the reserve corps.

With regard to the Prussian army, Herr von Roon said last year:—"Every Prussian is bound to defend his country well; to do that, he "must be capable of taking part in her defence. Our army is a "people's army, not because it puts forth certain popular attractions, "but because almost the entire nation is capable of bearing arms "and belongs to the army. The army is the school for the military "training of the people." He puts the strength of the Prussian army at $9\frac{3}{4}$ per thousand of the population; while he says that the proportion of France is 10 per thousand; that of Austria, 11 to 12 per thousand; that of Russia, 13 per thousand.

If we now look at our own Reserve, I need scarcely say that its bulk consists of Militia, Yeomanry, Volunteers, and Naval Reserve; nor particularly notice the enrolled Pensioners, and other such bodies.

General Peel, in his speech upon the Army Estimates, reported in the *Times* of March 5, 1859, says as follows:—"England can never,

"by any possibility, enter into competition with foreign countries in "respect to the number of men. Hence the great importance of the "militia as an army of reserve; because, on any sudden emergency, it "would be very unwise to raise fresh regiments, which the country "would not permanently require; because as soon as they became "efficient, there would be a probability of their being again reduced, "and, moreover, before they could raise them, their place would be "supplied by the embodied militia."

With the exception of the militia, it is not to the purpose of our present lecture to discuss the merits of the various branches of the service. I will merely notice one fact of very great importance—that the volunteers, of whom I have the honour to be one, form a mass, whose services are indeed to be depended on in case of invasion or imminent peril, but upon whom the country cannot call for permanent duty.

No; volunteers will fight when there is actual need, and right well, I doubt not. But in long continued threatenings near home, in foreign wars, and campaigns at the other side of the world, the force you must depend upon to supplement the line must be your militia. There is no mistake as to this. Either you must largely increase your standing army,—and let me remind you that afterwards you cannot so easily reduce it without time,—or you must avail yourselves of the constitutional army of Old England—of your militia.

There you have a body of men already under discipline and drilled, tolerably acquainted with other military duty, who, if well officered and well treated, produce in a few months, nay weeks, many regiments fit to stand by those of the line.

Further, to quote the words of one of the most talented lecturers in this theatre, "The presence of the regular troops may be, on the first movement of invasion, considered almost an accident, and their functions should be of manœuvre, as a reserve to consummate the defeat prepared by the resistance of the militia," to which we must now add, of the volunteers.

Thus pointing out the position of that force, I will attempt very shortly to sketch its history, and consider its present nature and requirements.

For 400 years, under the Heptarchy, the system still subsisting in Sweden was that of the several kings.

The feudal militia had plenty of training then; for one petty king principally passed his time in waging war against another petty king.

With this lamentable state of affairs we have little concern.

When King Alfred, in 871, came to the throne, he appears to have had plenty upon his hands. But one of the first things he did, and which I doubt not was the means of ultimately consolidating his power, was to organize that militia which, though clad in uniform slightly different from the "regulation" of Alfred's time, still bears his crown upon its colours.

Alfred, like a sensible man, took advantage of existing obligations, and merely improved upon the fyrd, or armament of the people.

And successive kings, even the succeeding dynasty of the Normans,

did not neglect the militia, but thankfully developed its vast resources.

We will not trace each succeeding enactment by which its position and duties were defined or circumscribed, nor will we chronicle the happily extinct jealousy felt by the people, and shewn almost absurdly at times by the Houses of Parliament.

It will be more to our purpose to glance at some of the more recent services which the militia has at all times readily given to this country.

At all times it has been found that the militia could be depended upon, not only to do service in their own sections of the United Kingdom, but to volunteer without hesitation, as the Royal Buckinghamshire Regiment was the first to do, for service in Ireland. There both English and Irish regiments took great and honourable part in quelling the rebellion. The 103rd, or Limerick City Regiment, had the honour of receiving the French at Sligo, in 1798, and the French liked it so little that, though many accepted Irish hospitality more permanently, it was as involuntary guests, whilst the French republican colours were captured by the Light Company of the Armagh Militia, who led the attack, left in front. These were the first French republican colours taken by British troops.

The Lord George Gordon riots shew how militia perform home duties: the Surrey regiments cleared the city and the bridges at the point of the bayonet, whilst the accounts of the conduct of some others are not much to their credit.

During the Peninsular war, more especially, the volunteers from militia regiments amounted in some instances to more than double their establishments. During the Crimean war they were not less zealous. They volunteered in whole regiments for foreign service, and doubtless would have "gone to the front" had that war lasted much longer. I remember being much affected at a militia inspection in those days, by the sight of a crowd of brave fellows, who came up to enlist in the Line. And I venture to say that when they are really wanted in the future, this country will at all times find no lack; and further than this, cursorily, it does not behove an officer of that force to dwell upon militia services. Only remember that the history of that force constitutes, up to a very modern period, the history of British arms.

The essentials for a soldier in the ranks, granting the will and the needful strength and intelligence, are—it is a sad platitude to say—proper opportunities of brigade as well as other drill, and of submission to discipline, and in the next place, good officers, both commissioned and non-commissioned.

I have been credibly informed that the present Government contemplate looking into the state of all our Reserves. This is, in some respects, much wanted, and I hope they may be guided by a spirit of true economy to spend as little money on as great efficiency as can be.

I hope it may not be considered out of place if I here allude to the gratification that was felt last year by the militia at the presence of those members of the Royal Family who attended the review of what I

may term the "home" regiments in Hyde Park. Independently of the instructive value of brigade drill to disembodied regiments, the approach of that field-day had, without doubt, great effect upon the men, and kept their attention awake, since they have their pride as well as others, only let it be rightly encouraged and taken advantage of. I believe that review really to have been an event of national importance, and this because the policy and the safety of this country depend upon its militia organization for defence; and that review recognized the important position of the force as the Army of Reserve.

In this room has been set forth a system of district defence, which, in many respects, shewed what I must call real genius. We have also recently had suggested valuable plans for coast railway artillery, and many other applications of modern discoveries and scientific applications to the art of defensive war.

My remaining task is a more humble one—merely to submit to your consideration a few modifications in militia administration, which would cost the country scarcely anything, and which would, it appears to me, enable us to improve the discipline of the men, keep up the efficiency of the officers; and add greatly to the *esprit de corps* of all ranks.

All innovations are attended with some inconvenience, with labour, and with doubts. All innovations in an established system are necessarily slow, and, for this reason, they require to be constantly kept before the public, and to be constantly discussed. A remarkable instance of this is afforded by Dr. Fergusson, the father of a gentleman to whom we are indebted for a lecture containing some new ideas upon earthworks. At a time when this valuable Institution did not exist, Dr. Fergusson suggested almost every improvement since adopted in the military service, but which, for want of such opportunities as the present, did not attract the public attention which they deserved.

Among the names of those who, with indefatigable zeal, have worked for the benefit of the soldier, one will occur to every member of this Institution—that of Lord Herbert. That great and good man, before his immense energy had prostrated his physical powers—unable, alas! to resist the calls of so great labours—left the militia the constitution which, I venture to say, has, upon the whole, answered the public expectations.

If my hearers wish to recal to mind a most masterly exposition of a boldly innovative scheme, let me refer them to Lord Herbert's speech upon the introduction of the Militia Bill in 1860, upon which the *Times*, of June 27th, in the same year, makes the following, among other, remarks:—

"We must give openings to those who can devote two or three "years to the service, for those who can spare a few weeks in the "year, for those who can spare a few hours in the week, and even for "those who will simply pledge themselves to be forthcoming on a "serious emergency.

. . . . . "The very notion of the militia is that it is the indi-

"genous force of this country, officered by men enjoying influence "and virtual command over the feelings of the people.

"They may or may not be country gentlemen, of old families and "landed property; but they ought to be men holding real sway by "virtue of their position and character."

The rest of the leading article which I have just quoted will be found exceedingly valuable.

At present the old constitutional army and the line are kept separate and unconnected. The county regiments of militia are numbered independently of those of the line. For instance, the North Gloucestershire regiment is the 28th of the line, whilst the Royal North Gloucestershire Militia is the 69th. The Wiltshire is the 62nd of the line, the Royal Wilts Militia is the 33rd; and again the depôts of the line have nothing to do with the counties from which they are supposed to be derived. Now, it is true that the Irish element greatly predominates in English as well as in Hibernian regiments, but I think that, without injuring the supply of that valuable material, the county enlistment and the tone of the men would be much improved if they were more identified with those counties. To my idea every county regiment should have, at least, one line battalion and one militia battalion. They should bear the same number, and when there is more than one line regiment from a county, the militia regiments should take the number of the senior line corps. The depôts of both line and militia should be the same, within the county and within the same walls, and quite unconnected with the great drill depôts we have lately organised, to which detachments should be sent for the legitimate purposes of those depôts—drill.

Might not recruiting for both battalions of the county regiment be thrown upon the combined staff of the two? Every effort should be made to identify the line with the county for the sake of making the lines-men feel that they are still mangold-wurzel-shire men, and looked upon with a kindly feeling by mangold-wurzel-shire people; and the militiamen, that they too belong to that crack regiment, the billionth, must look smart, be smart, and keep up the credit of the corps.

I think you will agree with me that, as far as possible, regiments should be officered from their county; the militia by the county gentlemen as regards the higher ranks, and in the lower by the cadets of the county families, whilst the line officers should, one and all, have served in the militia.

This will, I fear, never be; but I think we might take certain steps which would bring us nearer to that *desideratum*.

At present no officer of militia, or very few, can reckon upon any profit or consideration for entering that service; whilst he is liable, after some years' service as a subaltern, to see some lucky man of more acres, or some officer of the line, appointed to the company he considered his due.

There is much soreness felt on these occasions, and much involuntary injustice done. But it certainly is very desirable that the commanding officer of a regiment of militia should, on special occasions, be able to dispose of a company out of the course of seniority. Would it not be

a great thing if we could point out any plan of doing this fairly, and in a manner which should, in most cases, avoid rendering any officer dissatisfied.

I think such a plan might, to a great extent, be put in practice; but let me first protest against being thought to approve of the tendency of county men not to take commissions under the rank of captain.

I think every man, in every station, is the steward, before God, of his talents, property, wealth, and influence, and if he is to serve his country it should be in any way in which he will best serve that country. That he should wish to get a company is excusable, but, if that cannot be, it should be no reason for his declining the service; to do so is contemptible, vain-glorious, and priggish.

But there are such men, and they are sometimes of value to the regiment from their position, and we must meet their cases.

At present no militia officer who has not served in the line has any chance of a staff or other appointment.

There are about 250 officers on the militia staff as adjutants and quartermasters, and of these probably not more than about 15 *bonâ fide* militia officers have received appointments.

Now, there is one rule which has been suggested, and which, I think, ought to be established as a canon of military regulations. It is, that whenever a company or an appointment on the militia staff goes out of the regiment, a commission in the line should be open for competition, first by the subalterns—mind, Gentlemen, I say subalterns *only*—of the regiment; failing these, secondly, of the county regiments generally.

It has also been proposed that no officer above the rank of subaltern shall be eligible for a staff appointment; and that subalterns should receive brevet rank of captains aften ten years' service, also to restore to all such as after those ten years' service still remain subalterns and are not on the staff, disembodied allowance (which formerly was 2*s.* 6*d.* per diem). This is the only additional expense I am at present advocating.

Candidates for adjutancies might be allowed to qualify by embodied service of three instead of five years, and to be attached to a line regiment at their own expense for one year, this service to count, of course.

There then, would be a few chances for a militia subaltern voluntarily to stay in that rank. This would give a percentage of companies to be disposed of out of the regiment without injustice to those ranks. Many who did not want 2*s.* 6*d.* a day or a staff appointment would wish for companies; but the number of such would be lessened by the circumstance of the acceptance of that command, disqualifying at once for any other benefit.

I would also carry brevet rank to the higher grades. You may remember the American who proposed to raise a corps, in which, by giving everybody the honorary rank of brigadier-general, all anxiety and jealousy as to promotion was to be done away with.

Now, without advocating such distinctions being showered down on the surprised militia—although it would indeed be a refreshing shower

—I think that captains, after a certain length of service, should have brevet field rank, but that, to avoid difficulties on active service, this last rank should only hold in the militia itself; and I think—you see we are approaching the brigadier—that lieutenant-colonels, who are, in some respects, in the most responsible and troublesome posts imaginable, fairly earn a brevet full colonelcy in the course of some years.

Civility and rank are not expensive things to bestow; and, up to the rank of a field officer, I consider that a man who serves in the militia must be the purest form of patriot to be found in these days; for how many even make use of the title of captain, whilst what earthly hope lies before a subaltern, so far as any advantages go?

With regard to those officers to whom disembodied allowance is proposed to be granted, they might be made to do some little work; and there is one thing which will some day, I hope, be required of every such officer, and of every officer on the staff, viz., the most intimate knowledge of all details of the county topography, military geography, resources, and so forth.

Hunting men know their limited district in this manner. I do not think many will dissent from the opinion I hold—that the officers of the militia of a county ought to know that county, as the saying is, "like a book." They ought to be able to give superior officers, in case of war, the most minute particulars.

There is one regiment, not a hundred miles from here, the commanding officer of which, with a solicitude for the welfare of all ranks, dictated by a deep interest and a warm attachment to the service, has established allotment gardens, and set up a bookbinder's and a carpenter's workshop at head-quarters, besides encouraging the staff in other occupations as much as possible. This is a great good, which should be carried out all over the country; it tends much to keep up the tone of the non-commissioned officers.

I may here be permitted to make a passing allusion to a report—though a vague one—which has reached my ears, that the reduction of the army is to be made to throw a number of men into reserve.

If so, I hope it may not be forgotten that the natural reserve of each regiment, according to the county plan, is its militia battalion. This presents one instance of how that plan comes in on every occasion.

The militia is a force which has done great deeds for its country, and may do so again. And it is to be hoped that no Foreign Minister will ever be able to repeat the words used by the Bishop of Arras, in 1559, and quoted by Froude*:—"Is it not strange," he said, "that ye "believe that the world knoweth not your weakness? Your men be "hardy and valiant; but what discipline have they had these many "years? And the art of war is now such, that we be fain to learn "anew at every two years' end." Words, Gentlemen, wonderfully applicable at the present time.

A great man has said that every one has his price. To some extent

* Froude, vol. vii, page 161.

this is true. Wherefore, if you want a good material for your reserve, and painstaking officers of good position and attainments, you must —mind, I do not say by unnecessary expenditure—treat them well, and, above all, define and recognise their position.

I will not tire your patience with further details. Those who care for such, I may refer to an article which I wrote for the "British Army and Navy Review," and which appeared last April, the revise of which, however, I had not the opportunity of correcting.

Let me acknowledge the great mass of information, kindly supplied to me, of a small portion of which only I have been able to avail myself on this occasion. Amongst others I may especially mention Mr. Gosch, of the Danish Legation, General Hamilton, Colonel Walker, of Berlin, Colonel Shafto Adair, Lieutenant-Colonel Alcock, Lieutenant-Colonel Mandrot, of the Swiss Federal Staff, and Captains Dyson and Ibbetson, of the Royal East Middlesex Regiment, all of whom have afforded me great assistance. But it is to be distinctly understood that none of these gentlemen are, in the slightest degree, responsible for any of the opinions I have expressed in this lecture.

In thanking you, Gentlemen, for the very kind attention you have bestowed upon me, allow me to make one last observation: in all the other forces we have cursorily reviewed, we have seen nothing approaching our peculiar English sources of supply.

It is, Gentlemen, the great glory of England, and the greatest guarantee of the safety of our firesides, that every sword that is drawn, every rifle that is loaded, every gun that is run out, and every boarding pike that is clutched for our defence, is so done by hands, each of which has been offered, with its owner's free will, for the service of his country and its Queen.

The CHAIRMAN: Ladies and Gentlemen, before concluding, the lecturer expressed his sense of obligation to those who had provided him with some of his materials, and, in a similar spirit, I think that I may anticipate the wishes of this meeting in proposing their thanks to Mr. Marshall Hall for his lecture, and for the ability with which those materials have been digested and arranged. There can be, I think, no doubt, but that the particulars with respect to Denmark, Sweden, and Switzerland will be considered of much interest.

A graceful tribute has been paid to the memory of the late Lord Herbert, which was, I observed, appreciated by this audience, as it must be by every one, particularly by the militia force of this country, and above all by those who within these walls have heard the voice of that great man, when he advocated the interest, and an increased consideration for the health and the comfort of the soldier.

I have now the pleasure of conveying to you, Mr. Marshall Hall, the thanks of this meeting for your lecture, and for the ability with which you have dealt with the materials at your command.

LECTURE.

Friday, March 16th, 1866.

MAJOR SIR HARRY VERNEY, Bart., M.P., in the Chair.

ON THE GENEVA CONVENTION OF AUGUST THE 22ND, 1864, WITH SOME ACCOUNT OF THE NATIONAL COMMITTEES FORMED FOR AIDING IN AMELIORATING THE CONDITION OF THE SICK AND WOUNDED OF ARMIES IN TIME OF WAR.

By Deputy Inspector-General T. LONGMORE, Professor of Military Surgery at the Army Medical School.

The CHAIRMAN: I have the pleasure of introducing to you Professor Longmore, Professor of Military Surgery at the Royal Victoria Hospital, Netley. He has seen a great deal of service in the Crimea, and he has given particular attention to the subject which he brings before us to-day. Professor Longmore was sent by our Government to the Conference which was held at Geneva two years ago; and I beg to mention to you that this morning Miss Nightingale said to me, she thought there was no person better qualified to give an opinion upon the subject, and to discuss it, than Professor Longmore.

Professor LONGMORE: In the early part of last winter it was intimated to me that the Council of the Royal United Service Institution desired to have a lecture on the subject of the International Congress, which was held at Geneva, in 1864, for ameliorating the condition of the wounded soldiers of armies in the field by obtaining a treaty for their neutralization, and I was asked if I would undertake its delivery. I acceded to the request without hesitation, and I did so for two reasons. The first was that I knew there existed no little misapprehension in the minds of some persons in this country respecting the objects of this Congress, and considerable doubt as to the practicability of carrying into effect the terms of the international treaty which resulted from it; the second was, that having had the honour of being sent to the Congress as one of the representatives of the British Government, and, moreover, having acted at the Congress as one of the members of the sub-committee, whose duty it was to weigh carefully the written terms in

which each article of the Convention was expressed, I felt I probably possessed the means of removing some of the misapprehensions to which I have referred, and of showing that the treaty contains nothing which is impracticable or inconsistent with national or military requirements. It also appeared to me that I might, perhaps, be of use by calling attention to the advisability of steps being taken in this country for the formation of a national committee, similar to the committees which have been formed in most other European countries, for aiding their respective Governments in time of war in ministering to the necessities of sick and wounded soldiers. I am impressed with the importance of the subject being considered now, while we enjoy the leisure of peace; and of the committee, if one should be formed in this country, being organised and directed by persons holding positions of social weight and influence, as well as by officers possessing extended military experience; so that whatever preparations may be made, or course of action resolved upon, the steps taken in case of war breaking out may be uniform, may be such as will excite sympathy and confidence in the nation at large, and, at the same time, such as will harmonize with the necessities of campaigning and the general arrangements of military service. Keeping the several objects I have named in view, I propose, 1stly, to lay before you a brief sketch of the circumstances which gave rise to the International Congress in 1864; 2ndly, to explain the results of the Congress, as exhibited in the articles of the Convention acceded to by Her Majesty's Government; and, 3rdly, to describe the functions of the National Committees which have been formed in the principal countries of Europe, as well as to submit a few reasons for the establishment of a similar committee in this country.

Firstly, then, as to the *history* of the Congress. No one who studied the moral and political progress of a nation can fail to notice the prominence of certain successive periods in its history, within each of which a general condition has been arrived at, notably favourable for the development of some fresh and important advance in civilisation which has followed. It seems to be similar in moral progress to what we often observe in the progress of physical science, which, owing to successive additions to its stores of knowledge, and to concurrent circumstances, from time to time reaches such a stage of improvement, that important discoveries, or valuable applications of the information already gained, spring from it, almost spontaneously, as it were, and occur to the minds of several individuals nearly at one and the same moment. The apostles of moral and political advancement, whose names are household words among us, have, in frequent instances, owed their success and influence, not merely to their own zealous efforts, but also to the fact that they raised their voices at a time when many had become prepared and well disposed to listen; whereas others, equally zealous, and of equal power, had previously failed in advocating the same doctrines, because the period favourable for their reception had not yet arrived.

So it seems to have been in respect to the International Congress and treaty of which we are now speaking. There was nothing in the

objects of the Congress, there is no provision in the treaty, which has resulted from it, which had not been previously advocated by able and earnest men of various countries. Not only had individuals advocated, but in some instances the commanders of armies in the field had of their own accord agreed to and carried into effect, the principles embodied in the articles of the Geneva Convention. Such instances, however, have been few, and are remarkable as exceptional cases. The fitting time has only recently arrived for what was exceptional to become the rule, for such topics as those which are embraced in the Geneva Convention to excite general interest, and to be held to be of sufficient importance to European Governments to enter into a treaty respecting them. We must look to the vast increase in the means of diffusing information; to the facilities for rapid personal intercommunication; to the general attention now paid to the great events which stir mankind, of which wars are among the most stirring in their nature and their consequences; to the spread of more civilised and humane feelings, and the abatement of national animosities; and to the higher estimate of the value of life everywhere, if we seek for an explanation of the altered circumstances of our times in respect to the matters of which I am speaking.

The moral influences, no less than the military circumstances of modern battles are greatly changed by the changed conditions of things around us. While the names of the killed are hardly known at the place of action itself, while the numbers of the wounded are scarcely counted, electric messages inform the world that a battle has been fought, that a victory has been achieved, or a reverse sustained. The fears and hopes of thousands are at once excited, and general sympathy is awakened. While the wounds of the wounded are still recent, and the lives of many who are under the care of the military surgeons are still trembling in the balance, private communications from comrades, or from friends who have hastened to assist in the relief of sufferers, and public accounts multiplied and diffused far and wide by the press, rouse the attention of all ranks of society to individual concerns, and to detailed incidents of the conflict, to an extent which was unknown, and, indeed, impossible before the existence of telegraph wires, railroads, steam, and of all the machinery for the rapid diffusion of intelligence and personal observations, which exist in our epoch. In former days the *general* results of war were made public, the knowledge of *personal* circumstances was exceptional and limited to a narrow sphere; now the personal are almost as widely known as the general results. No wonder, then, on the one hand, that in former days the evils of war, being regarded as incapable of mitigation, or being unknown until all power of affording aid was passed, were left to be dealt with entirely by the governing authorities; or, on the other hand, that in our time public sympathy has sought to lessen these evils by committees of relief, by volunteer assistance, by donations of materials, by patriotic associations for the support of widows and orphans, by the special employment of soldiers disabled for ordinary occupations, and by various other means too numerous to be mentioned; or even that the mitigation of the rigours

and sufferings of war should be thought worthy of being made an object of international concern.

It was undoubtedly to the direct influence of the work, written by Monsieur Henry Dunant, entitled "Un Souvenir de Solferino," as well as to the personal exertions of that gentleman, that the movement which led to the International Congress of 1864 and its results was immediately due. Monsieur Dunant, a Swiss gentleman, was travelling in Italy on his own account in the year 1859, and was in the neighbourhood of Solferino on the day of the great battle of the 24th of June. The aspect of the battle-field, the sufferings of the vast numbers of wounded scattered over it, and the occurrences which he afterwards witnessed in the hospitals, where Monsieur Dunant remained for some days assisting as a volunteer in attending upon the wounded, excited in him the strongest mental emotions. Notwithstanding the able arrangements of Baron Larrey, the chief of the medical service in the field; notwithstanding the liberal provision which had been made by the administrative functionaries of the French army, in surgeons, in the means of transport, surgical stores, and sick dietary; notwithstanding, in addition, the aid afforded by some of the inhabitants of the places to which the wounded were first brought, M. Dunant saw that many of the wounded, owing to the vastness of their number, were left for some days without attention, and still longer without an adequate amount of nursing and surgical relief, and he was led to consider whether there were any means by which this superadded suffering in time of war might be obviated. Thus was formed the train of ideas which subsequently led to the publication of the "Souvenir de Solferino" in 1862.

The work may be regarded as consisting of two parts, although the diction is continuous; the first being a description of the incidents which Monsieur Dunant had observed in the battle-field and in the improvised hospitals at Castiglione, on the road to Brescia, and elsewhere; the second being a series of arguments in favour of a proposition for founding in every country permanent societies of persons willing to prepare themselves for supplementing the regular military establishments of surgical assistance in time of war—volunteers trained and organized beforehand for carrying the wounded from the field, and for attending upon them afterwards in hospitals with requisite skill and care, under the direction of competent authority. Since it was on the field of battle, and in the crowded temporary hospitals in its immediate neighbourhood, that Monsieur Dunant had chiefly observed the want of sufficient assistance, it was in these situations that M. Dunant thought aid could most efficiently be given by devoted volunteers acting from motives of humanity and patriotism. I will notice presently how far such a system appears practicable to those who have considered the subject.

M. Dunant's work created a great sensation, and was quickly translated into several European languages. At the time of its publication there existed, and still exists, at Geneva a society called the Genevese Society of Public Utility (La Société Genevoise d'Utilité Publique), and this society appointed a committee, of which General Dufour, the Gene-

ral-in-chief of the Swiss Confederation, accepted the presidency, for the purpose of supporting and encouraging the dissemination of the proposals which had emanated from M. Dunant. The action of this committee subsequently led to the convocation of an International Conference on the subject. This was held at Geneva in October 1863, and was attended by delegates from sixteen Governments, viz., from Austria, Baden, Bavaria, Belgium, France, Great Britain, Hanover, Hesse-Darmstadt, Italy, Prussia, Russia, Saxony, Spain, Sweden, Switzerland, and Wurtemberg. This Congress, which must not be confounded with the subsequent Congress of 1864, sat four days, and discussed several articles which were laid before the assembled delegates for consideration by the Genevese Committee before named. Some of the propositions contained in these articles were assented to; others, especially those relating to the organization of corps of volunteer hospital attendants invested with independent action, were only accepted in part, and became considerably modified in the resolutions which the delegates finally agreed upon.

The delegates adopted and recommended a proposal that in every country central and sectional committees should be formed, for the purpose of supplementing in time of war, by every constitutional and practical means in their power, the regular hospital service of the army. But they did not support the articles in which propositions were contained for volunteer hospital attendants to be organized under engagements to serve during definite limited periods, with the right of being employed, according to their own desire, on duty in the field or in the hospitals. The articles proposed that these volunteers should wear a distinctive uniform; that their exclusively charitable character being recognized, their persons should be held sacred; and lastly, that following in the rear of armies, they should make no claims on the armies which they accompanied, but that they should take with them their own provision of means of transport, rations, and the material necessary for the exercise of their functions.

It was obvious enough to officers of military experience that these proposals, as they stood, would lead to interference with that unity and supremity of control which is so essential for military discipline and success, even if they were not altogether impracticable, and they finally assumed at the hands of the assembly the following shape: that the National Committees, under whose direction the volunteer hospital attendants would be trained, should, in concurrence with the military authorities, designate the places where they were to attend upon the wounded; that on the demand, or with the permission of the military authorities, the National Committees might send volunteers into the field on the understanding that, while there, they were to be placed exclusively under the order of the Commander of the Forces for duty. So far, then, as regards the manner in which the propositions which were submitted to this Conference of 1863 were dealt with; in addition, however, before separating, the delegates recorded by general vote a strong appeal to the Governments of all civilized nations to come to an agreement for according the benefits of neutrality to all soldiers of regular armies, whatever nation they might belong to, who

had the misfortune to be placed *hors de combat* by wounds or sickness in time of war, as well as to the hospitals receiving them, the hospital staff and attendants, and to any of the inhabitants at the seat of war who might give them assistance; that a common recognizable sign should be adopted to indicate the medical staff of all armies; and that a common flag should be adopted in every country to designate the military hospitals.

Two actions followed the resolutions of the International Assembly of 1863. One of these was the formation of National Committees in various countries; among others, in Austria, Prussia, and Denmark, where the committees were soon called upon to discharge their functions practically in the war which shortly afterwards occurred in Schleswig-Holstein. The second was a course of proceeding which ultimately led to the International Congress of 1864, for the purpose of considering the question of the neutralization of the sick and wounded soldiers of belligerent armies. This is the Congress from which the Convention emanated which we shall have to consider presently.

This Congress was assembled in accordance with a request from the Supreme Federal Council of Switzerland. The Geneva Committee which I have before mentioned, and to which the designation of "International Committee" had been given at the Conference of 1863, having ascertained that fifteen of the Cabinets of Europe were favourable to the adoption of a treaty for the neutralization of sick and wounded soldiers in time of war, as well as of the *personnel* employed in attending upon them, solicited the Swiss Government to invite the other Governments to take part in a General Congress for discussing and agreeing upon terms on which a convention on the subject might be based. The Federal Council acceded to the request, and proposed Geneva as the place of meeting, and the 8th of August as the time for opening the Congress. It was felt that Switzerland, with no permanent army of its own, and placed as a nation in an independent position, as it were, with regard to the conflicting interests of the great European powers, might initiate such a movement with grace and propriety.

The invitation was accepted by sixteen powers, and the Congress was opened, on the date before named, in a portion of the Hôtel de Ville at Geneva, which was furnished for the occasion by the Federal Government. The representatives, twenty-five in number, consisted of members of the diplomatic service, as well as officers of the military and medical staff of various armies. The deliberations lasted nearly a fortnight, and the terms were finally agreed upon for the Convention which was signed on the 22nd day of August by the representatives of twelve Governments who had accredited their delegates with sufficient powers for signing a treaty. Subsequently it was adhered to by four others, including our own Government. The accession of the British Government to the Convention was signed at London on the 18th of February, 1865.

The Governments which have acceded to the Convention, in addition to the Government of England, are those of France, Prussia, Spain, Portugal, Holland, Belgium, Italy, Switzerland, Greece, Denmark,

Sweden and Norway, Mecklenburgh-Schwerin, Baden, Wurtemberg, and Hesse-Darmstadt.

This is a remarkable instance of a general treaty brought about by the exertions of an individual in private life; at the same time, without the active support and operations of the International Committee of Geneva, but, above all, without an advanced philanthropy inducing a strong general desire for lessening as much as practicable the evils of war to individual soldiers, who, after all, have no personal feelings in the conflicts in which they are engaged, who only act as instruments; without these aids, it is more than probable that the benevolent efforts of Monsieur Dunant would never have achieved the work they at last accomplished.

I have thus rapidly glanced at the history of the circumstances which led to the International Congress of 1864. I have now to give some account of the several articles of the Convention which resulted from it.

It is important to understand that the particular aim of this Congress was to obtain the neutralization of wounded of belligerent armies and of the *personnel* and *matériel* which are necessary for their care and treatment. Hitherto it has not been the custom of war to regard soldiers disabled by wounds, any more than the surgeons or others in attendance upon them who might fall into the hands of an enemy, as neutrals. As already noticed, in a few exceptional instances, from motives of generosity or by special agreement between hostile generals, both wounded soldiers and military surgeons have been so regarded; but the general custom has been to regard them as prisoners of war, and, like all other prisoners, only to be given up on the principle of exchange. Equally all hospital and ambulance transport equipment or materials falling into the hands of the enemy were regarded as prize of war. The Congress of 1864 was solely to determine whether the humane principles which had now and then been applied exceptionally, might not, under certain limitations, be rendered consistent with military necessities on all occasions, and be established as a rule.

As to the question of a common flag, if the sick and wounded were to be treated as neutrals by belligerents, and if the military hospitals, attendants, ambulance transport, and the surgical materials necessary for the wounded were to be included in the protection accorded to the wounded themselves, it would naturally follow that a common flag, or some other recognisable sign, would be necessary to indicate them, so as to secure the protection they were entitled to.

I have dwelt upon the special purpose of this Congress, because it was supposed by some persons that the question of independent volunteer attendants, which had been discussed, as I have already mentioned, in the former assembly of 1863, was again to be opened and discussed in the Congress of 1864. This erroneous supposition led to the Congress being regarded with suspicion, and even with positive disapprobation, by some who would doubtless have regarded it very differently had no such views been entertained by

them. But it was only on a positive understanding that this question was not to be re-opened, and with a pre-determined resolution not to join in any treaty which included the admission of *independent* volunteers, that some of the delegates were sent by their respective Governments to the Congress. On examination of the articles of the Convention it may be noticed that all allusion to volunteers has been rigorously excluded from the treaty. In case of volunteer corps of hospital attendants being organized, there are other fields open for the exercise of their patriotic and charitable functions besides those with the armies operating in the field, where endless difficulties might arise from their independent presence under the ordinary circumstances of campaigning. Should their services be required in the field by the supreme military authority, they would doubtless only be accepted on the condition of the men of the corps becoming incorporated and forming for the time, part of the military establishment, and of their being subject to all the rules and articles of war; and then they would fall under the benefits of the treaty, because they would be comprised in the *personnel* of the hospitals under the second article.

The articles in which the terms of the Convention are embodied are nine in number, and the following is a copy of them in the translated form in which they were presented when the accession of the British Government to the treaty, was laid before Parliament.

"Articles of the Convention, signed at Geneva, August 22nd, 1864, for the amelioration of the condition of the Wounded in Armies in the field, and acceded to by the British Government on the 18th February, 1865.

Article 1.

"Ambulances and military hospitals shall be acknowledged to be neuter, and, as such, shall be protected and respected by belligerents so long as any sick or wounded may be therein.

"Such neutrality shall cease if the ambulances or hospitals should be held by a military force."

Article 2.

"Persons employed in hospitals and ambulances, comprising the staff for superintendence, medical service, administration, transport of wounded, as well as chaplains, shall participate in the benefit of neutrality whilst so employed, and so long as there remain any wounded to bring in, or to succour."

Article 3.

"The persons designated in the preceding article may, even after occupation by the enemy, continue to fulfil their duties in

the hospital or ambulance which they serve, or may withdraw, in order to rejoin the corps to which they belong.

"Under such circumstances when those persons shall cease from their functions they shall be delivered by the occupying army to the outposts of the enemy."

Article 4.

"As the equipment of military hospitals remains subject to the laws of war, persons attached to such hospitals cannot, in withdrawing, carry away any articles but such as are their private property.

"Under the same circumstances an ambulance shall, on the contrary, retain its equipment."

Article 5.

"Inhabitants of the country who may bring help to the wounded shall be respected, and shall remain free. The generals of the belligerent powers shall make it their care to inform the inhabitants of the appeal addressed to their humanity, and of the neutrality which will be the consequence of it.

"Any wounded man entertained and taken care of in a house shall be considered as a protection thereto. Any inhabitant who shall have entertained wounded men in his house, shall be exempted from the quartering of troops, as well as from a part of the contributions of war which may be imposed."

Article 6.

"Wounded or sick soldiers shall be entertained and taken care of, to whatever nation they may belong.

"Commanders-in-chief shall have the power to deliver immediately, to the outposts of the enemy, soldiers who have been wounded in an engagement, when circumstances permit this to be done, and with the consent of both parties.

"Those who are recognized, after they are healed, as incapable of serving, shall be sent back to their country.

"The others may also be sent back on condition of not again bearing arms during continuance of the war.

"Evacuations, together with the persons under whose directions they take place, shall be protected by an absolute neutrality."

Article 7.

"A distinctive and uniform flag shall be adopted for hospitals, ambulances, and evacuations. It must, on every occasion, be accompanied by the national flag. An arm-badge (*brassard*) shall also be allowed for individuals neutralized, but the delivery thereof shall be left to military authority.

"The flag and arm-badge shall bear a red cross on a white ground."

Article 8.

"The details of execution of the present Convention shall be regulated by the Commanders-in-chief of belligerent armies, according to the instructions of their respective Governments, and in conformity with the general principles laid down in this Convention."

Article 9.

"The high contracting powers have agreed to communicate the present Convention to those Governments which have not found it convenient to send plenipotentiaries to the International Conference at Geneva, with an invitation to accede thereto; the protocol is for that purpose left open."

I will now consider these articles separately.

The first article naturally provided for the security of the hospitals in which the wounded might happen to be collected. Military hospitals, both those in the field and those of a more permanent kind in rear, were to be recognized as neutral points, and to be safe from attack or disturbance. But as these hospitals were only to be respected for the sake of the wounded contained in them, it became necessary to stipulate that the presence in them of these sick or wounded was essential for ensuring a title to this consideration. Hospitals and their contents, when unoccupied by patients, would naturally fall under the ordinary rules of war, just as any other buildings or *matériel*. It became also evident, on discussion, that the stipulated immunity from attack of a hospital might, in certain situations and under certain circumstances, be abused, and it was necessary to provide against such an abuse. A mortar battery might be so placed in rear of a hospital as to be incapable of attack so long as the hospital itself had to be respected; or the hospital might be placed in a position of strategical importance, with a military force holding the position, under pretence of guarding the hospital. The restriction that the neutrality would cease if the hospital was held by a military force became therefore necessary. Of course a simple guard, for the maintenance of military order and discipline, was not intended to be included in this restriction.

Military hospitals, with certain reservation, being thus recognized as neutral, it next became necessary to define the *personnel* who were to be included in the benefits of this neutrality, and to lay down any restrictions necessary for ensuring that the neutrality should only be applied to the purposes for which it was admitted. In the first place, the neutrality of the hospital *personnel* was only agreed upon in the interest of the wounded, not for the individual benefit of the persons comprising the *personnel*; and, in the second place, the interests of every army at large would require that steps should be taken to guard against persons moving among its ranks, and perhaps abusing the opportunity of

observation thus afforded under cover of neutrality. With these ends in view, the second and third articles of the treaty were framed. In defining the *personnel*, all the classes of persons usually comprised in the official organization of military hospitals were included, not only the medical officers and their subordinates, but those also in whom the functions of general superintendence, administration of supplies, and transportation of wounded were vested; in short, all the official hospital establishments. To none of them, however, was accorded the neutrality, excepting so long as the sick and wounded needed their services. They might remain on duty with the wounded of the forces to which they were attached with impunity, even after the conquering army had gained possession of the ground on which those wounded were—a great boon under circumstances where the conquered might happen to speak a different language from the conquerors, or when the latter had limited means of surgical attendance at their disposal. When no wounded remained to require their services, the neutralized persons would be permitted to rejoin the forces to which they belonged, and their neutrality would only cover them from the hospital up to their arrival at the advanced posts of these forces, to which they would be conducted under the charge of the army occupying the position from which they retired. These limitations obviated the risk of persons included in the second article abusing their neutrality for purposes of spying or idling.

The fourth article settles the terms on which the *materiel* of ambulances and hospitals is to be regarded under the treaty. By the first article, ambulances and military hospitals being only neutralized while containing sick or wounded, they and their contents would, by the laws of war, become the property of the conquering force when no sick or wounded remained in them. No reason for altering this was advanced so far as regards the fixed hospitals, but many reasons were found for mutually agreeing that this right of the conqueror should not be exercised so far as regarded the ambulances, or moving field hospitals. Take away the *materiel* from these—the stretchers and other articles of field transport, the means of dressing the wounded, the restoratives, the appliances for lessening the evils of transportation, and such things—and you deprive the soldiers who may be afterwards wounded, of their first means of safety, and add greatly to their sufferings. Moreover, while the stores and furniture of stationary hospitals are often collected in abundance as reserves, and are costly, those of the ambulances are necessarily limited, and of little money value as prize of war to the captors. The *materiel* of the ambulances was therefore neutralized, while only the private property of the *personnel* employed in the fixed hospitals was protected by this article.

The best plan for securing another important means of succouring the wounded, especially after great battles, was a subject of much consideration. This was to secure the aid of the civil inhabitants of the towns and villages adjoining the site of the action, an object frequently found very difficult to attain. It was felt to be of the utmost importance to adopt measures for dissipating the alarm which so frequently causes these persons to flee from the neighbourhood, and

for obtaining their services as early as possible after the conflict. At such a time the victorious army has generally to occupy itself not only with its own injured and dead, but also with numbers of the enemy, not to mention various other duties which devolve on it, and this is the very time when speedy removal from the scene of conflict and immediate attention, is of vital importance to the wounded. Hence the fifth article was introduced, by which not only protection was promised to inhabitants assisting the wounded, but a dispensation from the quartering of troops and other advantages were agreed upon for those who received the wounded and attended upon them in their houses.

The sixth article binds the contracting parties to the treaty not only to give requisite care and treatment to all sick or wounded who may fall into their hands, but also enforces the important principle that the misfortunes of those who are disabled by the effects of their wounds are not to be aggravated by the many depressing influences which are entailed by banishment and loss of liberty:— they are not to be retained as prisoners of war. If circumstances admit, and mutual consent is given, the wounded may be given up at once, immediately after an action, to be cared for by their own army. Otherwise, if they are retained, and, after proper treatment, are found to be disabled for service, they are by the treaty to be sent back to their own country and friends. It is left optional, as regards the wounded who recover completely from the effects of their injuries, for the contracting parties to determine whether they shall be sent back to their own country on condition of not serving again during the war, or whether this liberty shall not be granted. It was necessary to add a paragraph to this article to protect with neutrality not only the wounded or disabled soldiers while being convoyed to their destination, but those also who are engaged in the duty of directing the sick convoy.

To enable the neutralization of the ambulances, hospitals, ambulance transport, and their *personnel* to be effectually carried out, it was necessary, as I have before mentioned, to fix upon a common sign by which they might be recognized by all parties joining in the treaty. A flag was obviously the most convenient for the hospitals, both moving and fixed, and for sick convoys; but, for distinguishing the *personnel*, a *brassard*, or arm-badge, that could be readily worn over a coat sleeve, was fixed upon as the most convenient. The design proposed was a red cross, *alézée*, upon a white ground, and being simple, and, moreover, typical of the Christian principle of international charity embodied in the Convention, it was unanimously adopted. There was also a propriety in adopting this design, for the colours being changed it was the national flag of the country in which the Congress was then sitting, and to which,—a neutral country itself as it were in the midst of the Great Powers of Europe,—was due all the credit of the effort which was then being made to lessen the rigours of war by neutralizing its chief sufferers. But in adopting this flag and common sign two things were necessary. Firstly, it was necessary to indicate not only the objects and persons having a right by treaty to

be shielded by neutrality, but also to show to what country they belonged; the national flag was therefore required to accompany the neutral flag whenever the latter was used. Secondly, it was necessary to guard against any one assuming the use of the *brassard* who had no official title to it; therefore it was left to the military authorities to issue the *brassards* so that the right persons only should have them. To the Generals-in-chief of the belligerent armies was also left by article 8 the execution of the treaty in all other particulars under the instructions of their respective Governments; the object being to guard against any such rigid fulfilment of its terms being exacted as might on any occasion interfere with the general military interests, which, of course, must always be recognized as over-riding the interests of the wounded, and all other interests in time of war.

The ninth article provided for the treaty being left open for the subsequent admission of other Governments. A tenth article was included in the Convention, but this simply related to the formal arrangements for its ratification.

I have thus passed rapidly in review the terms embodied in the several articles of the Geneva Convention of 1864, and brought to notice the points which formed the chief subjects of discussion at the meetings of the Congress in reference to them. The treaty will materially lessen the misfortunes of those officers and soldiers who happen to be disabled by wounds or sickness in time of war, for it establishes their neutrality and the neutralization of all that is essential to their preservation and restoration to their country and friends; and it does this without in any way interfering with the military interests of the belligerents. Its execution has been mutually agreed upon by a formal compact between the Governments of sixteen countries and states, including all the great powers of Europe, with the exception of Austria and Russia, and, as the treaty is still open to them, it is to be hoped that, although they have not yet joined it, they will eventually do so, and that the principles of justice and humanity embodied in it, will become an established law among all the civilised nations of the world. The anxious consideration that was given to the articles of the treaty not only by the delegates of such military nations as France and Prussia, but also by the higher military authorities in those countries (for constant communication was kept up with the central authorities during the sitting of the Congress) is calculated to remove any doubts as to the practicability of carrying out the terms of the treaty. But the practical nature of the compact is proved beyond doubt by the fact, that on certain occasions, as I have before remarked, to the honour of those concerned, the very provisions embodied in the treaty have been carried into practice by mutual special agreement. An historical account of these occasions was printed and laid before the Congress by the International Committee at Geneva, and a notice of the principal among them may be found in the last edition of a little work entitled "La Charité Internationale sur les Champs de Bataille," which was published in Paris last year.

I have now to make a few remarks on the National Committees.

I have before mentioned that the International Conference of 1863, in addition to paving the way for the Congress of 1864, led to the establishment of National Committees in certain countries for assisting wounded soldiers in time of war, but I have not yet mentioned any particulars concerning these Committees. The general principles on which these Committees are formed were set forth by the Geneva Conference of 1863 in a series of ten resolutions. They may be summed up as follows. Each Central Committee is to organize itself, and to form sub-committees and sections, in the manner most suitable to the circumstances of the country in which it is placed, and to establish relations with the Government so that its offers of service may be acceptable when need of them shall arise. In time of peace, the Committee is to collect information on the best means of affording aid to the Government in case of war; to make itself acquainted with all improvements in the means of helping wounded soldiers; to employ itself in forming and training volunteers for service in hospitals approved by the authorities; to make a collection of the materials most necessary for sick and wounded; and, in short, to study all matters that may conduce to the great object of ameliorating their condition in time of war. Friendly relation are to be kept up between the National Committees of different nations, so that any improvements in field transport, or inventions likely to be serviceable to sick and wounded in campaigning, made in one country, may be made known in other countries, just as improvements in the implements of destruction are mutually observed, and generally without much reserve communicated, between nations on friendly terms with each other. In time of war, the Central Committees of the belligerent nations are to become the agents of the public at large for affording aid through the proper authorities to the sick and wounded of the respective armies, and, if required to do so, but only if so required, are to place at the disposal of the military authorities volunteer assistants for service in hospitals, or even for carrying or otherwise helping the wounded in the field of action itself.

Committees based on these principles have now been formed in nearly all the chief capitals of Europe. These Committees present the names of military and civil persons distinguished by their official rank or social standing, and are generally under the patronage of members of royal families. In France, the Emperor has himself given marked encouragement to the undertaking, and the Central Committee in Paris has been constituted with the Minister of War as honorary president, and a General of Division as president. No Committee has as yet been formed in England, and I will presently mention some circumstances which lead me to think this a subject for regret.

Before stating them, however, I may mention that some of the National Committees formed since the Congress of 1863 have had the opportunity of practically exhibiting their usefulness in time of war. The campaign of Schleswig-Holstein in 1864 gave opportunities to the Central and Sectional Committees in Prussia, Austria, and Denmark of supplementing with advantage the official means of hospital assistance. The Central Committee at Berlin organized and furnished

volunteer assistance, both in *materiel* and *personnel*. An appeal was made for surgical aid, and it was answered by sixty-eight young civil surgeons being sent to help in the hospitals at the seat of war, with the consent of the military authorities. In Copenhagen and Vienna, the Central Committees equally collected funds and assistance of all kinds for the sick and wounded, and organized a systematic distribution of them.

Doubtless there will not be less interest shewn as regards the troops of this country, should they become engaged in active hostilities of an extended nature, than has been exhibited in the more important wars of recent years; and there can be no one among us who is not familiar with the volunteer philanthropy of this nation, its liberality, and the examples of personal devotion that were so conspicuous during the Crimean campaign and the Indian mutiny. Indeed, in case of such a calamity occurring—I say calamity, for even when war is waged on the justest principles, for the protection of the weak, for the maintenance of national honour and independence, it is still acknowledged by all thoughtful persons to be one of the greatest calamities that can befall a nation—in such a case it seems likely that public interest will be even more strongly expressed than it was on the occasions to which I have referred, especially if the war in which our army be engaged should take place in Europe or in America. Some of the circumstances which I named at the commencement of my remarks as being so favourable for the convocation of the Geneva Congress of 1864; the strong hold and great influence which humanitarian doctrines have attained as one result of the spread of civilization; the great activity of thought among people at large; the rapid communication of intelligence to great centres almost irrespective of distance, and its immediate circulation through whole communities; the facilities for personal movement and observation by land and sea; all these are daily on the increase, and this increase will still further tend to ensure the maintenance of continued watchfulness, not only over the army as a body, but also over the personal concerns, the health, and the welfare of all the individuals composing it. While the loss of life resulting from the direct effects of a battle must ever be regarded as one of the inevitable results of war, unnecessary loss of life from deficient means of transport for the wounded, deficient surgical aid, deficiency of needful supplies on the field of action, will be closely scrutinized. The wounded officers and soldiers will be watched from the place of fighting to the hospitals, and anxious attention will be given that in no way that can be avoided by care or expenditure of means, shall loss of life occur, or health suffer, while they are engaged in the active service of their country.

The best organization for meeting the urgent medical and surgical demands which would arise in time of war in the British army, has been most carefully studied. It would be out of place for me to refer here to the details of the plan on which the military medical arrangements have been approved by the Government of this country to be worked in time of war; suffice it for me to say that I believe the system to be as admirably contrived and as capable of expansion in

case of need as that of the medical department of any army in the world. But even if the approved plan of assistance for the sick and wounded should be thoroughly carried into execution, and should be practically applied, as regards the provision of *materiel* and *personnel*, in the same liberal spirit as was contemplated by those who designed it, this provision, liberal and well organized and well prepared as it would then be, would still require to be supplemented by popular aid in case of a great battle or a prolonged campaign. No Government in the world could afford to maintain a medical staff, or to provide the necessary means of meeting the wants of such a battle as that of Solferino, in the way that the wants of the wounded are now expected to be cared for. The *percentage* of wounded is stated to have been less at Solferino than it has been in any other great battle for many years past; but still the vast number of wounded which were thrown upon the care of the allies after that battle—about 20,000—not to mention the sick requiring care at the same time: the great extent of ground over which they were scattered: the rapidity with which the troops had been concentrated, defeating all the efforts for bringing up at the same time many necessary surgical stores: these created demands that no Government establishment alone could have possibly supplied. The treaty of 1864 will facilitate to some extent the meeting of such emergencies in future, for a proportion of the surgeons and medical staff of the conquered can be left behind with their wounded without fear of being retained as prisoners of war; and the wounded themselves, as soon as they are fit to move, can be restored to their own countrymen for care and treatment, and the charge that will fall upon the conquerors will be thus proportionably lessened.

There are two directions in which, in such general engagements, deficiencies are liable to be experienced. One is in the number of the executive—the surgeons, and the hospital attendants upon whom so much depends, men trained for properly carrying the wounded, and for attending upon them under the directions of the surgeons;—the other is in the means of transport, and in hospital stores. One of the proposals, as I have before mentioned, at the International Conference of 1863, was that independent volunteer aid in both these respects should be afforded on the field itself. I have already said that this proposal cannot be held to be generally practicable. To be ready to give help at any moment, such a volunteer establishment must move with the army; and the rationing of the men and of the transport animals composing the establishment and its movements by independent means in time of war, as proposed, could not be carried out. But is this volunteer assistance, therefore, inadmissible in every way? This by no means follows as a matter of course, and here one of the useful qualities of the National Committees might show itself. On the same principle as in time of war, a portion of the home defence would be left to volunteer combatants, while militia regiments would be moved to take the place of regular troops in colonial garrisons, and the regular troops be thus set free for work in the field, so it seems feasible that under the direction of the National Committees, and with the concurrence of the Government, volunteer hospital corps could be utilised in time of war.

The men of the army hospital corps, under ordinary circumstances required for performing the duties of the home and of the intermediate hospitals which the necessities of war require to be established (and which will probably be greatly increased in numbers in future, from the now proved importance of distributing the sick and wounded over a wide area in small hospitals to prevent army epidemic diseases, instead of crowding them together in single towns or large buildings), this regular corps might in the same way be rendered available for duty in the field hospitals, their places in the former being taken by the volunteer assistants. But this plan, to answer, must be regularly organized on a definite system, in communication with the Government, and this would be the work of the Central National Committee. There would be no reason why volunteer hospital attendants, after sufficient experience, and with proper organization, should not be drafted to serve in the field to meet necessities that might exist there, on demand and under appropriate regulations. Emergencies might arise in which, due regard being given to the just interests of the regular and permanent establishments, very valuable and material aid might be given by such means to the military authorities and the Government, as well as benefit conferred on the sick and wounded of the army. So with material aid. During the Crimean campaign vast supplies were collected in England from hundreds of independent sources, but from want of system, a large proportion of the supplies, valuable as they were in themselves, were rendered useless from being inappropriate in kind, or from arriving when they were no longer required. In all recent wars, every Government has received aid from the nation towards supplying the wants of those injured in the nation's cause. At the opening of the Italian campaign in 1859, a depôt was opened in Paris for the reception of old linen for the manufacture of charpie, and in a few days some tons were presented, and other donations from the nation, for the sick and wounded of the French army rapidly followed. In Austria, from the number of sick and wounded sent out of Italy, shown by official returns to be not less than 48,713 men, we are told "public sympathy and interest was largely aroused; hospitals were "opened in many remote places; the Empress formed one at Laxenberg; "others were opened at Hetzendorf, Trieste, near Vienna, and many "other places; ladies of the highest rank attended in these hospitals; "and patriotic societies everywhere arose who forwarded stores, food, "and money. The telegraph was of the most essential service in "rendering the distribution of the sick possible." I need do no more than allude to the wonderful work of the Sanitary Commission organised in the United States of America during the late civil war, for that has already been ably described by Mr. Fisher in a recent lecture in this theatre. I may remark, however, that I do not think any one can study the work of that vast association without coming to the conclusion that the beneficial influence it exerted as regards the armies of the United States was beyond calculation. With all the wonderful energy, the vast expenditure of treasure, the immense surgical resources, which the United States' Government brought to bear for the relief of the sick and wounded of their armies, and the able

administration of the medical bureau at Washington, these means, without the aid afforded by the Sanitary Commission, would have been very far short of what was necessary for preserving the health of the troops in the degree in which it was preserved after that national association was in full operation, and without this preservation of health most important advantages must have been lost, and the war probably greatly prolonged. I have already alluded to what has been done by some of the National Committees since their establishment in 1864, and need not again refer to them. If a similar National Committee were established in England, one of its functions would be to organize the distribution of the national donations and aid on a proper footing. Should this country remain without the formation of such a committee, it will find itself at a disadvantage, as compared with neighbouring countries, in case of becoming engaged in a great war. Committees no doubt will be formed and subscriptions poured in as has happened hitherto, as soon as there is need of them; but, as heretofore, there will be absence of system and independence of action, and there will not be the advantage, at any rate at first, of Government support; while, in other countries, on war breaking out, the necessary preparations will have been long made and fully considered, everything will be systematised on preconcerted plans, so as to harmonise with the arrangements of the Government and the action of the combatant and army medical authorities. These are some of the reasons which induce me to hope that this country may yet have its National Committee on the same footing as the National Committees on the Continent.

In conclusion, I would observe that I have purposely avoided any attempt at exciting feelings in favour of the Convention of 1864, and of the formation of a National Committee in this country, by attempting to draw a picture of the sad collateral events which spring from war, or of the sufferings of those who in the course of duty fall wounded on the field of action, and become inmates of our military hospitals. Those who have been witnesses of fields of battle and the occurrences which follow in the ambulances and hospitals, need no description to induce them to attempt to mitigate, as far as practicable, the sufferings which are undergone in these situations; and to those who have not witnessed these scenes, any description from me would convey very inadequate ideas concerning them. Neither have I attempted to bring to notice the names of those who have already stood prominently forward in trying to lessen these evils; they are recorded elsewhere. I have attempted simply to carry out the plan I laid down at starting, viz., to give a plain narration of the circumstances which led to the International Congress of 1864, to lay before you a brief exposition of the articles of the treaty which resulted from it, and to give some account of the National Committees which have been formed in various countries for aiding in ameliorating the condition of sick and wounded soldiers in time of war, as well as to suggest some reasons for the formation of a National Committee with the same objects in view in this country. It appeared to me that I should thus best fulfil the task I had undertaken at the request of the Council of this Institution.

The CHAIRMAN: We are extremely indebted to Professor Longmore for the very interesting address which he has been so good as to give us on this most important subject. He has traced the history of this movement and work, and he has shown us with what good judgment and good sense, and in how practical a manner, it has been carried on all through. He has observed that which I think must be patent to all of us, that when such efforts are made for the perfecting of those instruments of warfare by which human life is destroyed, it is also natural and right that those who are influenced by feelings of humanity, should employ their best exertions to endeavour to preserve human life, and to lessen as far as possible the miseries and horrors of war. I believe no better means could be devised than those which have been suggested, and which were described by Professor Longmore for the formation of these National Committees. I am myself acquainted with M. Dunant. I know how highly he is respected in his own country; I know how he was occupied before he devoted himself to this subject; and I know that his efforts have always been directed to the improvement of the condition of his fellow-countrymen, and to the promotion of every humane, religious, and civilising object. It appears to me that if this Committee can be carried out, in case we engage in it, it may have the effect of enabling us not only to mitigate the horrors of war in themselves, but really to form connections with those who may influence the various Governments of Europe to abstain from war, and to encourage rather the arts of peace. Wars may be necessary, as Professor Longmore has said, for the vindication of a nation's honour, and for the defence of one's own country; but the more public opinion can be brought to bear upon the Governments at whose instance wars are undertaken, the more benefit will accrue to nations at large. Professor Longmore has well said that the soldiers, who are the individual sufferers in war, are not those for whose interests wars are made. Professor Longmore very wisely abstained from harrowing our feelings with descriptions of what takes place in war; but there are a few words in one of these newspapers which have been sent to me, which I will venture to read to you. It is in the *Journal de Genève*, of February, 1864:—

"Rappelons aussi qu'à Flensbourg il y a peu de jours, faute d'une "organisation créée d'avance et de comités bien constitués, les "malheureux blessés n'ont pas été relevés, et que gisant ensanglantés "dans les rues de cette ville les roues des chariots de l'artillerie leur "ont passé sur le corps."

It really does convey an impression of the great want of medical and surgical assistance in the time of war, that the poor creatures who had been fighting for their country were lying in the streets, and by a military necessity, artillery, being called to fire on the enemy, these poor creatures were absolutely destroyed by their own artillery passing over them. Now, if such a corps existed as Professor Longmore has suggested, a corps of volunteer assistants in time of war, the wounded might have been moved away, and most likely hey would have been transported from the place of danger, and

received such assistance as could have been given them. There is one subject on which I feel extremely anxious myself in regard to what has been brought before us; that is, that if we take a part in this international work, our own Government should not consider themselves in the least degree freed from the responsibility which in my opinion attaches to every Government, that of taking care of the sick and wounded in time of war. I believe it is true that no Government can be prepared beforehand for all circumstances that are likely to take place, in case we are engaged in a future war. It would, indeed, be a matter of great regret, and a great misfortune, if any Government should think itself liberated from its own first and most imperative duty, and I rejoice much to know that in the international exposition which is to take place in France in the course of the year 1867, a special department will be organized in this most humane and admirable cause, and that persons will be invited to exhibit any machines or instruments, or means of providing for the care of the sick and wounded in time of war, and that every facility will be given to afford information upon this most interesting and important subject. I see also that the Prussian National Committee has offered a very handsome prize for suggestions upon this subject, and I hope some papers will be sent from this country. But the practical object which, I understand, Professor Longmore desires to bring before us, is rather that we in this country should establish a Committee to co-operate with our own Government, and I suppose also with foreign Governments, for the promotion of this work. And if the lecture which Professor Longmore has given, should lead us to form such a Committee, I am sure we shall all rejoice in that which may relieve the distresses of war, and which may, under Divine Providence, have even the effect of preventing war.

General Sir WILLIAM J. CODRINGTON, G.C.B.: There is one point upon which I desire to ask a question. Every person must be gratified with the intelligence with which Professor Longmore has characterised his lecture. I think I heard him mention that no country would go into war better prepared for the succour of the wounded than our own. It would be interesting to know what those preparations actually are for the care and removal of the wounded from the field to the field hospital, and from the field hospital to the more permanent hospital in the rear.

Professor LONGMORE: In reply to the question, I would beg to say that the arrangements which have been made by our own Government, including those for the care of the wounded on the field of action itself, as well as others, for the transportation of the wounded from the field to the ambulances, or field hospitals, and, thence, to the hospitals in rear, are now defined in the authorized army medical regulations. I consider that these arrangements have been made on as liberal a scale as those which exist in any European country.

General CODRINGTON: I only want to know what is the actual preparation? Are there men told off for the purpose? I want to come to the practical part of it.

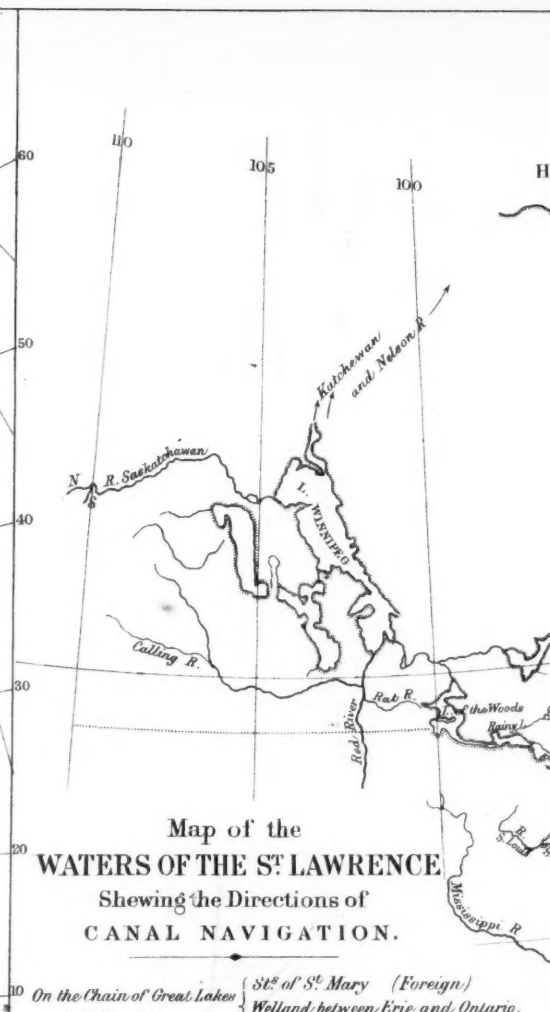
Professor LONGMORE: As regards the men, I can only practically

speak of those told off for staff employ. As to those for regimental service, I only know that recommendations have been made, and orders have been issued to make provision for the proper care of what may be expected to be the proportion of wounded of regiments in action by the previous instruction and preparation of certain soldiers in those regiments, set apart specially for this duty. The purpose was that these men, being only trained for attending on the wounded, for hospital work, and not in rifle practice, should not be liable to be taken away for fighting purposes, leaving the wounded without proper relief; how far this is carried out in practice I cannot say. As to the necessity for such a provision I don't think there can be two opinions. As regards the staff arrangements, there is now in this country an "Army Hospital Corps," which has only been formed or rather received its present constitution, since the Crimean war. That Hospital Corps now numbers about 1,000 men in its ranks. It is regularly organised. Every man belonging to the medical branch of the corps, nearly 500 in number, is systematically trained, or in course of being trained, in the duties of carrying and tending the wounded, both on the field itself, and in the hospital subsequently. There is every reason to believe that this corps will prove of essential service in time of war; though the number available for surgical duty being so limited, it will doubtless require expansion to meet the wants of a campaign.

Map of NORTH AMERICA,

Shewing
The Directions of the
Chief Water Systems
of the
CONTINENT, *Vix*

I. *St. Lawrence.*
II. *Saskatchewan.*
III. *Pacific.* { *Fraser* / *Columbia*
IV. *Mississippi.*
V. *Mackenzie.*



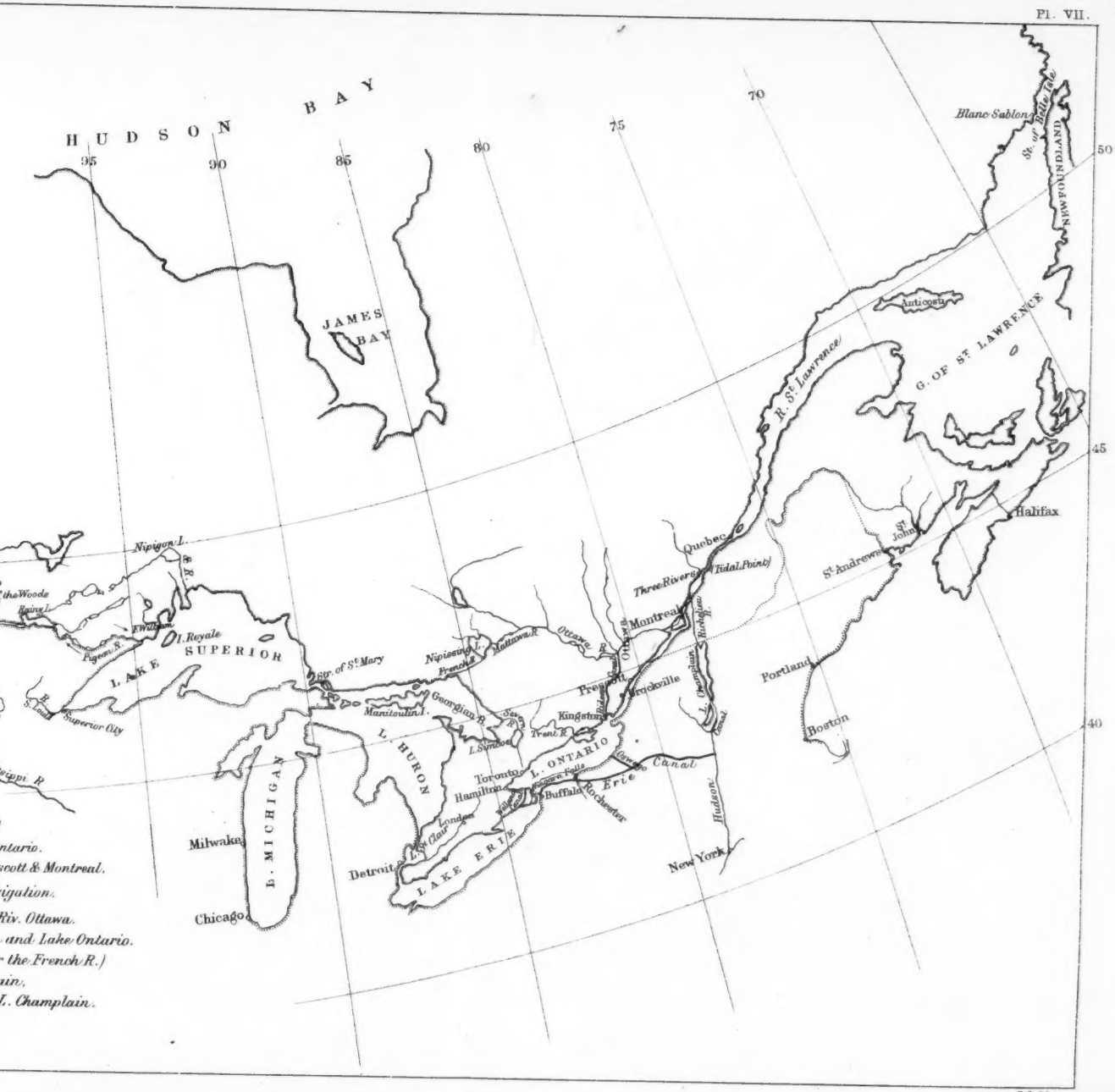
Map of the WATERS OF THE St. LAWRENCE

Shewing the Directions of
CANAL NAVIGATION.

On the Chain of Great Lakes and the Frontier. { *Sts of St. Mary (Foreign)* / *Welland between Erie and Ontario.* / *St. Lawrence Canals bet. Prescott & Mon*

Between Montreal and Kingston. The Rideau Navigation.

Routes proposed { *By French River, L. Nepissing and Riv. Ottawa* / *Between Georgian Bay, Lake Huron and Lak (to Torento or the Fren* / *Between Montreal and L. Champlain, or by the Richelieu and L. Champl*



ntario.
scott & Montreal.
igation.
Riv. Ottawa.
and Lake Ontario.
the French R.)
ain,
L. Champlain.

J. Johbins

Evening Meeting.

Monday, March 19th, 1866.

Rear-Admiral Sir F. W. E. NICOLSON, Bart., C.B., in the Chair.

NAMES of MEMBERS who joined the Institution between the 19th February and the 19th March, 1866.

LIFE.

McClintock, Wm., Lieut. R.A. 9*l.*
Clarke, H. Wilberforce, Lieut. R.E. 9*l.*
Kelso, B. Lieut. R.N. 9*l.*

ANNUAL.

Lempriere, H. R., Lieut. 67th Regt. 1*l.*
Peyton, T. G., Capt. Hereford Mil. 1*l.*
Wix, A. McKerrall, Ens. 5th Fus. 1*l.*
Smith, Wm. Capt., R.A. 1*l.*
Stucley Stucley, Sir George, Bart., M.P., Lieut.-Col. Devon. Mil. Art. 1*l.*
Neave Everard, S., Cornet 21st Hussars. 1*l.*
St. John, H. C., Esq., Lieut. R.N. 1*l.*
Hime, H. W. L., Lieut. R.A. 1*l.*
Walton, Clifford, Esq., Dep.-Asst. Com.-Gen. 1*l.*
Nicholson, Henry, Lieut. R.N. 1*l.*
Heley, E. C. S., Capt. late 84th Regt. 1*l.*
Irby, L. H. L., Major, 74th Highrs. 1*l.*

THE LAKES AND CANALS OF CANADA.

By Lieutenant-Colonel Millington Synge, R. E.

The chain of the great lakes of Canada is part of the water system of the St. Lawrence, and the canals of that country are works, distributed in several localities, but all with one common aim, which is to complete a navigation that is unrivalled both for extent and quality as an inland and freshwater navigation.

Canada is remarkable, even to a disadvantageous extent, for the large proportion of its surface which is taken up with rivers and lakes, and more particularly with lakes which intersect it in every direction, and, together with the rivers, occupy almost or altogether one-half the area of the province. This large distribution of water is not, however,

without its advantages, and the directions which the main arteries of navigation pursue throughout the British-American territory are indicative of a future of activity and prosperity which it requires only determination and courage to attain.

The St. Lawrence system pursues its course with steady uniformity from west to east. Its head waters closely approach, or actually mingle with, those of the system of the plains of Central British America, the waters of which find their way into the same Atlantic, but possess a striking diversity of characteristics, in that they converge from all the cardinal points of the compass. The basin of Lake Winnipeg gathers from the east, streams which are in proximity with the waters of the St. Lawrence, from the south the Red River, which connects it closely with the Mississippi, and the magnificent Saskatchewan rolling down from the summit level of the Rocky Mountains of the West unites with these in that same basin of the Winnipeg to flow in one volume to the north through Nelson River into Hudson Bay, and thence to the Atlantic. Again, the head-waters of the Saskatchewan commingle at their sources with others flowing out from the same springs, but which, by an opposite outlet, find a comparatively short but tumultuous passage into the Pacific ocean.

Another system not inferior either in extent or grandeur to any of these occupies the north-west corner of the continent, and completes that penetration by natural water-paths which characterises all British North America in a remarkable degree. The magnificent Mackenzie River, which pours into the Arctic Sea, gathers its tributaries on the tops of the Rocky Mountains from among the same fountains which supply the Frazer and Columbia rivers of the Pacific and the Saskatchewan of the Atlantic, whilst by its arms or its connections stretching out towards the east, by the Athabasca and Churchill rivers, or their branches flowing in opposite directions out of Lake Wollaston, it comprises an actual waterway, with obstructions, but without interruption of flowing water, on the track of a north-west passage.

Thus there are four great water systems which, speaking broadly and generally, may be said to form and to express the characteristics of the regions in which they severally are, and in so far to govern the conditions of those regions as they determine the directions of travel and intercourse within their respective limits. These are the St. Lawrence in the east, the Saskatchewan in the west, the Mississippi in the south, and the Mackenzie in the north, and it is essential to the right appreciation of the character and value of the formation that lies within the province of Canada to bear in mind its character and position as an unit in, or an element of, the entire water system of the continent, and the penetration of the St. Lawrence and Saskatchewan together to the very foot of the Rocky Mountains.

Before passing to the more detailed consideration of that branch of these waters which is more particularly the subject of this paper, it may serve its scope and object to draw attention to one or two maxims, truisms perhaps, but apt to fare as such in being as much disregarded in practice as they may be promptly conceded in argument.

Firstly. Directions of commerce shape the course of nations.

Secondly. Means of communication influence so as to determine the directions of commerce.

And, lastly, an insular position has singular advantages for purposes of commerce and for defence.

These principles, or truisms, have this bearing on Canada, her lakes and her canals, that her inland navigation places certain great advantages within the reach of her attainment. The full benefit of these she can secure only by following the indications of her broadly marked physical geography in her works of construction, and by her adoption in her commercial regulations of measures which will at the same time satisfy the proper exigencies of her political position. If she do this she will immeasurably increase her own material prosperity, and in so doing she may do yet more, for the direct tendency of these acts would be lastingly to determine the character of her nationality. She would render her future secure, and the development of her resources certain as an intimate, an honoured, and a valuable component of the empire.

The security of her territory, and the full confidence that it is secure, is the great want of Canada. This is, in fact, the question which determines, for both parties, the real value of all colonial possessions. Capital flows to attractive fields if they be secure, and contentment waits upon industry labouring in security.

In the case of Canada, political, industrial, and commercial, rather than purely military measures, are needed to confer upon her this security and its assurance. Her inland navigation is superior to any means of communication that can be brought into competition with it; but her articles of export, lumber, grain, flour, and the like, are bulky, whilst, on the contrary, her imports are manufactured articles occupying small bulk. Vessels consequently obtaining in general only a cargo one way, ocean freights have hitherto more than counterbalanced the advantages of her inland superiority; but Canada has it in her power to create an import carrying trade that shall reverse this condition by the further improvement of her navigation, and by the adoption of a tariff more truly adapted to her real interests, especially aided, as her endeavours would be, by the existence, side by side of such better policy, of the prohibitive commercial legislation of the adjoining federal republics.

I have no doubt but that I shall best comply with the wishes of the Committee if I adapt the considerations that follow rather to the sphere of this Institution, than enter upon such as are more strictly fitted to geographical or engineering discussion. I purpose, therefore, to describe the navigation of Canada, the nature and position of the expanses of water that form the lakes, and the works which constitute the canals, very briefly, dwelling more upon the advantages conferred by that navigation, and on the bearing and importance of those advantages. In the Appendix to this paper you will, however, find, I trust, all that information given fully which it might prove tedious verbally to recapitulate.

The water system of the St. Lawrence begins nearly midway across the continent. Under the name of the River San Louis, its head-waters

flow into Lake Superior at the south-western extremity of the lake in about 46° 36′ N. lat. and 92° W. long., at Fond du Lac, the site of the present Superior City, Minnesota, and these waters define the boundary of British America as it would be determined by the mid-channel of the waters of the St. Lawrence and the lakes. The actual boundary has, however, been carried on a higher parallel of latitude (about that of 47° 15′), where a chain of comparatively trivial rivulets and small lakes terminates in Lake Superior; and Ile Royale, which is intersected by that parallel, has also been yielded by treaty. The geographical position of the tract thus marked gives it extraordinary value. Between these boundaries north and south, and between Lake Superior on the east and the western boundary of Minnesota, is an area of about 30,000 square miles, or of an extent equal to about that of Scotland. Over it the communication with the colony of Red River is already established by means of railroads, steamers, and stages, which traverse its unobstructed highways. The harbour of Superior City is good, and it is the natural outlet of a great part of the country westward. Enjoying the double advantage of being in immediate proximity to old established countries—that is, comparatively speaking—and of being of prairie rather than of granitic formation, it has become the channel of intercourse with the Red River country, whilst circumstances and a granitic formation have combined to retard the opening of that intercourse through the northern tract that has been kept in the dominion of England. The other chief western head-waters of the St. Lawrence are the Kamenis Toquoiah River, at the mouth of which Fort William, a post of the Hudson Bay Company, is situated, and the Nepigon River, a sheet of water of large but unknown extent, not that its borders have not been explored, but its dimensions are not known to have been ascertained. Both are within British territory, and are admired for the wild beauty of their scenery, and the latter for the well nigh unequalled sport which both river and lake yield to anglers and fishermen. They are also said to afford the means of comparatively easy communication on the westward route towards Lake Winnipeg. The Kamenis Toquoiah River is known for its romantic falls, a beautiful sketch of which appears in a folio of drawings by Captain Warre, taken so far back as about 1845.

Lake Superior, 300 miles long and 140 miles broad, is of rather larger dimensions than the extent of country just spoken of. Its surface comprises 32,000 square miles, which is about the same area as that of Ireland. It has been said, possibly rather with effect than with strict accuracy, that the mean surface of the lake is exactly 600 feet above the sea level, and its bottom 600 feet below that level. This assigns to the lake a depth of 1,200 feet. I have heard that in places a line of that length has failed to touch the bottom; but I believe the mean depth of the lake to be about 1,000 feet. The straits or river of St. Mary conveys the overflow of this enormous basin, and connects Lake Superior with lakes Michigan and Huron. This river falls 20 feet within a distance of half a mile. The impediment which is thereby caused to the navigation is overcome by a canal, the works of which are of the most perfect description; but they are on the alienated side

of the river. The mean depth of these lakes is said to be the same as that of Lake Superior. The area of Lake Michigan is 17,000 square miles, that of Lake Huron 21,000 square miles: the latter only is within British territory. The continuous formation of the islands of Manitoulin, which seem but an extension of the northern promontory of Upper Canada that stretches into Lake Huron forms the Georgian Bay, itself an inland sea that is of the very highest importance with reference to the maintenance of the power of England in America.

Lake Huron, particularly in its lower portion, tends directly to the south. The River St. Clair, which expands about midway in its course into a small lake of the same name, connects the waters of Lake Huron and of Lake Erie. Many wrecks take place on the St. Clair Flats, and the navigation is treacherous as well as difficult; but there is no fall or impediment in the river. Lake Erie turns abruptly to the east. The level of its waters is 10 feet below that of the waters of Lake Huron. It is a smaller sheet of water, in fact only one-third the size of the former, having a surface of 7,500 square miles, which is, however rather more than twenty times the joint area of the Channel islands and of the Isle of Man. Lake Erie is exceptionally shoal, having a mean depth of only 120 feet. It is astonishing no limited liability company springs up to drain it. The soil is very fertile, and the chasm of the Niagara River close at hand for an outlet.

The waters of Lake Erie pour down the Niagara River into Lake Ontario, but its celebrated falls separate the navigation of these lakes, excepting for vessels not beyond the capacity of the locks of the Welland Canal. There is a difference of 330 feet between the levels of these lakes. A descent of about 50 feet takes place in the rapids above the falls, and the vertical fall of the cataract itself is 165 feet. The torrent is hemmed in for seven miles below the falls in a gorge from 200 to 400 yards in width. There the river opens into a flat country, and flows with a diminished current for 12 miles more, where its waters reach Lake Ontario, the least, although probably the best known, of the great Canadian lakes.

I must not detain you merely with description, and I certainly do not mean to attempt to describe Niagara; but as possibly this paper may be read by some who, from admiration of the beauties of creation, may think of a pilgrimage to that fair wonder, I may, perhaps, with some advantage in such a case call your attention to the grandeur of Niagara in winter. In America there may be a tendency to treat it as a fine water privilege, and on the spot in summer it certainly is horribly vulgarised by the influences that then surround it; but standing before it, when it is free from these, I can readily understand the poetry of the ancients leading them to personify, though unfortunately they also deified, their glades and their watercourses. Niagara seems essentially the queen or goddess, not the king or god, of waters. Notwithstanding the enormous mass of waters, which I leave others to compute, and notwithstanding that the roar of the descent has given it the name of the Thunder of the Waters, there has always seemed to me a gentleness, a quietness, an imperturbable dignity, and yet a seductive coyness, a majesty and yet a

play of consciousness about this beauteous wonder to which I know nothing akin save in the spirit of a woman. Broken, as it were, to fragments in the long and magnificent rapids above, the volume collects in exquisite dignity, so to speak, on the brink of its great catastrophe, and gliding unbroken over the awful edge shields itself only with a gossamer veil tinted with every glittering ethereal hue that ever imagination dreamed of. Though the misty pillar ascends a thousand feet into the heavens, and is visible from the far off opposite shores of Lake Ontario, the fleecy spray cloud as it falls like a drapery before the deep robe of the deity seems to weave itself in very playfulness into every pattern it may choose, never, with all its fairy gorgeousness, hiding or overpowering one ray from the rich sea-green and shell-like tints behind. In winter every accessory is in harmony with this scene. As you ascend the gorge you seem to have entered the precincts of the fairy queen. The majestic stalactites, pendant in long magnificent succession on either side of the precipitous banks, are columns of the same dream in diamonds, or pearls, or frosted silver filagree, yet all of the solidity of temple work. The trees festooned with the like draperies, the slenderest twig become a column or an arch, blend their proportions with the scene, and all seem to wear the livery of the palace of the fairy queen, who stands in the amphitheatre, that forms as it were her throne, in her unchanging glory of repose, for, strange though it may seem, this is, I think, the dominant impression made by dwelling on Niagara. Ondine and naiads become intelligible realities, and it is hard to believe that this fascinating water beauty, like many another made in a different mould, would remorselessly dash to destruction the maniac mad enough to entrust himself unto her. The illusion, perhaps you will say the dream, of a regal presence is not a little aided by the quiet which the waters again display at the very foot of the fall; but at the bend of the river, just beyond the Presence of the Queen, is the whirlpool with all the turmoil and confusion of the most disorderly ante-chamber of any drawing-room.

One more word of Niagara thus wreathed in winter glory. The cones, as the great masses of frozen ascending water and spray, formed at the foot of the falls, are termed, hem in, in continually diminished space, the cataract and the vapour formed in the never ceasing act of falling. These pinnacles, or rather mountains of ice, reach nearly and sometimes quite to the summit of the cataract, and gradually arching over towards the fall as the great mass gains more and more power to congeal the vapour rising and falling in contact with it, they have joined the ice stretching out from the river bank, or formed on every surface caught or exposed by the tumultuous rapid above. By such an arch the cataract has been scaled from the bottom of the cone below, and in and over such a chasm, nearly closing, I have seen the rainbow playing, shining with a vivid brilliancy as though composed of innumerable particles of crystallized, yet living, light. In places near the lesser cataract, the frozen skirtings admit of the closest approach to the fall, the chasm, and the cone, to the hemmed in cataract and the ascending volumes of spray, till it seems as though

one were oneself enwrapped in the brightness of that bow as it springs out of this accumulation of beauty, and spans the gorge of the river with its other extremity, its summit in the heavens, and surrounded everywhere with another—and yet another reflection. It is like the living spirit of beauty joying in the scene. It is the bright bow of promise, a symbol higher than of man's invention, speaking of joy and peace, emblematic of the happy energies that it may be, constitute the realities of rest. I acknowledge to a feeling of solemnity and a sense of unspeakable beauty in this work of glory in the elements of light and water only, that put aside even fairy thoughts and dreams of imagination, while there stole over my senses a thought of the tradition of the day in which creation was good in the eye of the Maker, and the hope of that day when, with man in excellency, it shall be so again.

On one occasion, owing to what is commonly termed an ice-jam, Niagara ceased to flow! No water went over, and an adventurous Englishman, living on the banks, planted the flag of England in the mid-channel of the rapids! They were dry! The sudden breaking asunder of that ice-pack, the renewal as it were of the cataract, must have been a glorious sight to see!

Lake Ontario, 190 miles long and 55 miles wide, has a mean depth of 600 feet, and an area of 6,300 square miles. With the exception of New London the chief towns of Upper Canada are on the borders of this lake. London, on the Thames, an inland town midway between the River St. Clair and the western extremity of Lake Ontario exemplifies the progress of Upper Canada. It is without advantages of either port or river navigation, and has achieved its success solely as an agricultural town. Five and thirty years ago not a tree was felled where it now stands; yet it is a solid handsome little town, in light-coloured brick chiefly, and, generally speaking, of good and unpretending architecture, whilst it now counts its population by thousands.

The Humber River, at Toronto, and the Trent River, which debouches in the beautiful Bay of Quinté, and forms the peninsula of Prince Edward county, have each been spoken of as affording a means of opening a communication between Lake Ontario and the Georgian Bay by Lake Simcoe, which is about midway between the two larger lakes. Either line, if it existed, would abbreviate the distance, and serve to avoid the dangers of the St. Clair Flats. Below Lake Ontario the St. Lawrence proper begins with that beautiful and far-famed expanse, the Lake of the Thousand Islands. The thriving little town of Brockville is the terminus of a railway gradually extending on the Upper Ottawa, and from Prescott there is another railway to the town of Ottawa, the great lumber depôt, and the capital of Canada, possibly that of Confederate British America hereafter. The once picturesque Falls of the Ottawa River are turned to great account as a "water-privilege," "crowded" on every available spot with mills that allow no rest, day or night, to the ceaseless operations of the saw; but, whoever has once rejoiced in the wild beauty of the rivers and forests of America, can scarcely fail, even whilst he is endeavouring to forward

the cause of civilisation, to regret that the steps of that civilisation are marked by the destruction of the wild beauties of nature even as its representative is wanting in the poetry that lingers round the savage. The analogy extends, I believe, farther, and the compensation and consolation are in either case the same. The desolation of the wilderness abounds over its beauty, and the vile among the savage is more common than the noble.

The rapids, which necessitated the construction of the St. Lawrence canals, in order that the river might be navigable, occur between Prescott and Montreal. Fifty miles below Montreal the river widens into the expanse called Lake St. Peter, broad, shallow, and with a soft bottom. The depth to which the channel of the river through this lake may be maintained, may be said to determine the maximum of draft of the scale of navigation above. That depth has, I believe, been fixed at 20 feet at low water. I may mention, as interesting in an engineering point of view, that the attempt to deepen this lake was unsuccessful so long as the effort was made by a straight cut instead of in the natural bed of the river. From below Lake St. Peter the St. Lawrence adheres to its north-easterly course; but calls for no further particular remark in connection with the present subject. It becomes more and more picturesque, more wild, more grand, and, above all, perhaps, wider and more wide, until, as it were, characteristically winding-up the scale of its gigantic dimensions, its delta, so to speak, is Newfoundland, a territory one-fourth larger than the kingdom of Ireland, but almost unknown; yet a land of wild rugged beauty, with waters teeming with fish, and with resources deserving more investigation than they have hitherto received. The passage up the St. Lawrence is fast losing the terrors with which it became invested so long as injudicious regulations of the Canadian postal subsidy led to the attempted prosecution of the voyage in the midst of fog or snow, with the consequent loss or injury of vessel after vessel.

The chain of waters from the head-water of Lake Superior is about 2,500 miles in length.

The canal navigation has been constructed principally in order to overcome obstacles occurring in the course of the great chain of the waters we have now traced. This is the object of the Welland Canal between Lakes Erié and Ontario, and of the St. Lawrence canals between Prescott and Montreal.

The opening of the Rideau navigation between the cities of Ottawa and Kingston, and the partial improvement of the Ottawa River as far as the city of that name, were, however, owing to the proved necessity of a means of communication between the upper and lower parts of the united province, that should be free from the perils of the frontier.

The *proposed* canals, which I believe to exceed in importance all that have been constructed, are advocated in order to shorten distance, to lower the cost of freight, to increase trade, and to give rise to new branches and to new directions of commerce.

In order rightly to appreciate the bearings of the several projects brought forward to these ends, a consideration of the directions they

adopt is necessary. The details of proposed construction, interesting as these are both in respect of the natural advantages which are afforded in the several cases, and as to the scale of construction, which would determine the class and size of vessels for which the improved navigation would become available, are yet of less importance than is the ultimate aim, or the consequences that inevitably would follow, upon the adoption of one or other of the schemes that are, and have been advocated. All have necessarily adhered, more or less, to the course of some apparent facilities or inducements for their adoption. They may be broadly classified as consisting of—

The enlargement of the existing canals from Lake Erie to Montreal.

The construction of a navigation between the Georgian Bay, Lake Huron, and Lake Ontario.

The construction of enlarged canal navigation connecting Montreal and the Hudson River, State of New York.

The opening of the French River and Ottawa navigation, that is of a navigation following the course of the Ottawa as far as the Mattawa tributary, and thence by Lake Nipissing and French River to Georgian Bay, Lake Huron.*

Of these, the last deserves an unreserved and unqualified preference on general considerations. It ought, indeed, to form the base and foundation of all others instead of being placed in comparison with, or in antagonism to, any other schemes of inland navigation; for it, and it alone, possesses this peculiar characteristic, that if constructed, it would make any of, or all, the others serve the prosperity and welfare of the province; but, if it were not constructed, each of the others would be attended with grave drawbacks and disadvantages. It does more, for it affords a cheap and peaceful solution of the difficulties attending the defence of Canada. If the country is to remain British, it is, therefore, a work of the first imperial interest, and if I have correctly named the most pressing want of Canada, it ought to be highly esteemed by the Canadians for its commercial value, if only as the means of establishing the security of the country, and thus re-attracting capital to its shores.

The general classification I have purposely adopted, almost of itself points out what the disadvantages of the other projects severally are, and you will remember that I have before asked your assent to the dicta that "directions of commerce shape the course of nations," and that "means of communications influence, so as to determine the direc-" tions of commerce."

The effect of the enlargement of the St. Lawrence and Welland canals would be to make seaports of the towns, both Canadian and foreign, on the inland lakes, and to confer upon those towns advantages similar to those which Montreal now exclusively possesses as

* This route (Ottawa and French River) is that which was taken by Samuel Champlain, the discoverer; and thus Lake Huron was actually reached on the direct line before European eyes had seen Niagara. It is also that which was followed by the Algonguins to avoid their enemies, the Iroquois on the St. Lawrence. Thus we have only to adapt to the exigencies of the present time a pathway indicated by nature as the most direct, and marked by circumstances as secure and safe.—M. S.

the head of ocean navigation. It is, therefore, a commercial and political measure of much value. The fear of losing the monopoly of an advantage so enviable, may array the class and local interests of Montreal against a scheme that would create seaports to the very fountain head of the St. Lawrence waters; but Montreal itself could scarcely fail to benefit even more largely in so great and wide-spread a prosperity than she does now from her monopoly, though, like monopolists, she may be blind to advantages which lie dormant through neglect, and, like monopolists again, she may be even more mistaken as to the possibility of maintaining a policy which becomes unjust as well as ungenerous when persevered in to the depression of others for selfish ends. These canals, however, are constructed on or near the frontier, and would require at the least as much defence as they could possibly confer advantage, were the defence effectual; but the enlargement scarcely affects the military view of the question. The insecurity is not increased, the value is of that which is already insecure. Indeed, the enlargement of these canals may be not wholly devoid of military advantage, provided always that the French River navigation be perfected beforehand.

The construction of a navigation between Georgian Bay and Lake Ontario aims at abbreviating distance by a direct cut across a comparatively narrow neck of land, avoiding the circuitous route of the front, and the delay of the Welland as well as the dangers of the St. Clair Flats. It is, therefore, in some measure, a rival to the enlargement of the Welland Canal, and it seeks to secure carrying trade from the Western States. If executed as a commercial speculation it might benefit the foreign towns of the west and those on Lake Ontario, as well as local interests at its own extremities. Viewed in opposition to the other projects it is inferior to them, and by itself calculated to have injurious rather than good effects on the general prosperity of the province. Its military character is hypothetical, but not altogether without merit. Supposing there existed a naval force on Lake Ontario and an inferiority on Lake Erie, it would establish a good communication with Lake Huron, whereby the flank of Lake Erie would be turned, and the upper waters reached for offensive operations in the west.

The construction of an enlarged canal navigation, connecting Montreal with Lake Champlain and the Hudson, though different in locality, is not dissimilar in its tendencies. It would deflect at Montreal and after the passage of the St. Lawrence canals, that trade which the Georgian Bay Canal would intercept upon the lakes and carry to Oswego. It would give great additional facilities for the trade between Montreal and Boston and New York. It would, as far as art possibly could do so, substitute the foreign ports of Northern States for the highway of the St. Lawrence, and tend to complete and perpetuate that assimilation of tone, feeling, favour, and affection that springs from exclusive or preponderating commercial relations. If met by a corresponding appreciation on the part of Massachusetts, New York, and other States in the North, the ultimate effect of such intercourse, unbalanced by any corresponding increase of commercial relations with Europe, can be denied, only by a contradiction of the maxims I have asked

you to concede. Unbalanced, such intercourse would necessarily be, for it can be formed only by the substitution of an artificial channel, and of foreign intercourse for the open ocean and commerce with home. The military aspects of this project are not of much importance. The line, if it were constructed, could be made ineffectual by either party, and its advantages used or destroyed according to the priority in skill or vigilance of either side. If viewed, however, as a commercial undertaking subsequent on, and subsidiary to, the enlargement of the St. Lawrence canals, this navigation assumes its proper and beneficial aspect. With the trade of the west free to find an ocean outlet at any port on the lakes, the freight to be carried will seek the best markets, and it would be judicious commercial policy to enable that trade to find those markets by the most perfect means of communication. The respective prices in North America and Europe would then the more freely determine the destination of the products of the west.

So far, however, we have been considering the branches, not what ought to be the trunk of all inland British American navigation. The question of primary interest to England in the whole matter is whether British America is to remain English; that of corresponding interest to the British provinces, and especially to Canada, is to know what their position is to be. A country of which the prosperity is paralysed and the development indefinitely retarded by a condition of uncertainty is forced by circumstances to think of something that irresistibly becomes of greater and more pressing weight, and of more immediate power than are even national predilections. These may exist, and exist strongly, and yet be compelled to remain what I have termed them, predilections—preference not choice. Circumstances may preclude a choice, aye, they may even compel a selection which is not a choice. The primary and pressing want of Canada is security and an assured sense of that security. So long as her future is thought to be undetermined, her energies are paralysed, her strength is fettered, and capital with its proverbial timidity keeps from her shores. Yet she has not on earth a foe to fear, except her contiguous and prosperous rival whose century of priority in birth is apt to be forgotten when comparison is made. The question, if not the temptation then naturally arises, can she not free herself from every danger by making common cause with the enemies of England. Her republican neighbours invite her with solemn acts of Congress, and frame their legislation with a view to her coercion. England informs her that her election shall be free. What then is her position at this moment but the monument of her decision and the proof of her attachment? And, if so, the question of her prosperity resolves itself into that of her defence, and the inland navigation of the province has so powerful a bearing on that question, that in dealing with the latter it cannot be passed by. I believe I shall state the condition of the question of defence with tolerable accuracy, if I say that England desires the connection if it can be maintained without imperilling even greater interests than would be compromised by severing that connection, and that Canada earnestly desires it if England will treat her, as she considers, fairly in the matter. It is the respective earnestness and hesi-

tation of comparative adventure and comparative wealth. British America is ready to give an unequivocal response, if England will maintain her protection *à l'outrance*. England, before giving an irrevocable pledge, determines not only to examine her power to redeem the pledge, but to count also the cost of the attempt. Obviously too much caution may prove imprudence; and too great precipitancy might prove rash. This is, I fear, a full and fair exposition of the case as it appears to stand; but unless it be sadly deficient, moral and national obligations are counted as nothing in the matter, just as the negotiation fails to point out what could sanction the act of severance, and, in counting the cost, it omits the heaviest item of the bill, for who can answer what would prove the cost of wrenching the empire asunder, and of destroying the influence, character, and power of England as a matter of deliberate monetary speculation? I do not think it is to be concealed, that the sentiment of Canada has been grieved, and the moral strength of loyalty injuriously affected by what has been there taken to be the affront of a needless expression on the part of many English, that they are welcome to sever the connection if they will. Historic precedent offers no justification of the assumption that the children of those who abandoned all to remain, as they believed, for ever children of a common mother should now be ready to change sides to the bitterest foes of England, if these latter know any truth in language. It would have been enough, reason the Canadians, to let the expression of the future be evolved from agreement or otherwise in the terms of a permanent connection. As the solution of the question of the British defence of Canada is on both sides emphatically one of will rather than of power, it is of the first importance to measure accurately the ingredients likely to make up that will. England seems to have required—I do not say she did require—I am advancing views which appeared to me to prevail, and that not unreasonably, in Canada—England seemed to many Canadians to require an unqualified expression of determination and to see that determination evinced in specified acts, before she would in any way bind herself to do more than establish a means of abandoning the continent on an emergency without the capture of her own immediate forces. Canada, too weak to stand alone, with the acts of the sympathisers in the troubled era of her rebellion fresh in her memory, with the fate of the Southern sovereignties before her eyes, and the language of bitter hate of England tingling in her ears, was called upon, or thought that she was called upon, to adopt a tone that would exasperate to the uttermost those upon whose tender mercies she might not impossibly be after all eventually thrown. Simultaneously writings were diligently disseminated over the length and breadth of the province, disparaging the province and the British connection, and exalting all the ways and characteristics of the enemies of England. Writings that owed the attention which they gained neither to the matter they contained nor to the quarter from whence they seemed to issue, and which, rightly or wrongly, were very generally deemed to represent predetermined intentions that seemed increasingly in danger of being carried out

in the policy of England. Having thus paralysed the energies of Canada, it was not difficult to represent her as backward in deed and lukewarm in attachment. All these circumstances require to be carefully weighed and borne in mind or, I believe, a very erroneous estimate will be formed both of the strength of attachment to British rule in Canada and of the conduct and policy of England in the question of rendering secure, or even possible, the continuation of the bond between the countries. But to revert to that of the cost to England of pledging herself to the defence of Canada. The general impression as to that defence, where there has been any thought at all about it, is probably derived from considerations in which the distance from the base of operations, the extent of frontier, the small number of the imperial forces in proportion to the extent of the empire, and an assumed overwhelming superiority of hostile numbers are the principal ingredients. The result is far from favourable, and the extent to which it is deemed politic to put forth the power of England is probably expressed in the arrangements for the evacuation of the country at a minimum of all save moral dishonour.

I believe however, that, like giants in a mist, the several difficulties will much diminish, and some even lose all their force on nearer examination. Granted that the enemy has his base of operations comparatively close at hand, that, irrespective of his resources on the Atlantic coast, he can supply himself from the lake shores immediately opposite and maintain his lines of communication by numerous railroads, that his numbers are incontestably superior and that the frontier is of very great extent, still much remains to be said and done before the cause has to be given up. The very inferiority confers specific advantages of no mean value. If the distance of the base of operations, where it is the ocean, is to be an insuperable obstacle, then farewell all imperial greatness and possession; but great in extent as is the frontier, those portions of it on which descent in force is possible can all be specified, and the very priority of development and superiority in wealth and resources of the enemy have their countervailing evils to his cause. To guard the country sacred from the tread of the invader's foot may indeed be deemed a hopeless task unless he can be forced to abstain from the attempt in the prospect of ultimate defeat, or of drawing down upon himself losses greater than the intended gain; but the important posts and towns of Canada can be counted, and a very inferior force might hold them all successfully, though the rest of the country were for awhile overrun, and columns, well commanded, that would retaliate on the enemy by counter-aggression might serve to open wide the eyes that may even now be dreaming of the tempting sweets of overrunning a defenceless province and of the glory of a triumph over the hated name of England, achieved with the pride of the semblance but with none of the realities of difficulty. Whilst the enemy could subsist only by the maintenance of his own lines of communication, the columns carrying the war into his territory would find subsistence everywhere. The facilities for counter-aggression are an effectual means in Canada's

defence. My own conviction, as I have said, is that the important ports and towns of Canada admit of being held by numbers relatively very inferior, nor have I any doubt whatever of the willingness of the Canadians not only to undertake the task of such defence, but to seek their share besides in turning the tables on the enemy by the necessary counter-aggressions. Even the important battle-grounds may be known beforehand and entrenched and occupied so as greatly to counterbalance superiority of number. Nor must the numbers of the enemy be computed from the scale of the late civil war. The acquisition of Canada could not evoke an effort that required a spirit of animosity such as the civil war provoked. Such an exhibition, if it took place at all again, would be directed against England, wherever her power might be found, and would be too bitter to be appeased without collision. It would not be a war for unity, and as yet the Republican States are not at all at unity. Moreover, the influx of European strength and sinew which brought about the subjugation of the South would scarcely, in such a case, be allowed to go on unchecked; nor is it to be supposed that England would be without European allies, for she certainly would not willingly go to war, even with her alienated and embittered descendants, unless not only clearly in the right but compelled by the necessities of an irreconcileable difference. That in a war the Canadians would be as ourselves there is no reasonable ground to doubt, and the enemy could not, for their subjugation only, raise the forces we have become accustomed to associate with his name.*

I have not been able to avoid what may have *seemed* like a digression on the defence of Canada, but it is *because the proposed navigation which remains to be considered, deprives that important question of its formidable aspect.*

The Ottawa River joins the St. Lawrence where the islands on which is Montreal are, in about 45° 31′ N. lat. The mouth of the French River is approximately in lat. 46°, that of the Mattawa in about 46° 20′. The course marked out by these rivers is therefore very nearly direct: the connection is almost complete. The distance is 430 miles, and shorter by 368 miles than the frontier route between the points which it connects. The saving in time, which depends on lockage, capacity, and other considerations, is estimated at 44 hours; the cost of movement per ton is computed under that of the existing or of the other proposed routes. The line marked by these rivers perfectly fulfils the essential military condition of being removed from the frontier. Indeed I do not know that there is a military requisite that can be desired, which it does not afford. Its general characteristic from end to end is that of a chasm in a granitic formation (crystalline gneiss), and on the French River more especially, in long straight lines, where a few guns in position could defend the necessary works, and destroy any fleet that might attempt to enter, and where the position of these guns

* The opinions expressed above have received a striking corroboration in the prompt repression of the Fenian threats of invasion through the *instant* turning out of an adequate volunteer force.—M. S.

would be impregnable. The direction of the French River, at its mouth, is N.E. to S.W.; the mouth itself, a straight cleft, deep and broad, about two and three-quarter miles in length, and the formation such, that whilst coasting along is highly dangerous, there are direct entrances between the rocks. The harbour on Lake Huron (Georgian Bay) is studded by small islands, with broad channels and deep soundings between. The archipelago of the Georgian Bay perfects the position for a fleet or for gunboats, which, whilst they could only be pursued at heavy disadvantage, would be ready at any moment to pursue or to attack the enemy.

If this communication were opened, so long as England retained her supremacy on the ocean—and it is not worth while to discuss any English imperial subject on any other supposition—gunboats could be placed as freely on the lakes as now on the St. Lawrence at Quebec; and if a war must come, it would be as much a naval war as one on land, with victory to be contended for as heroically and as sternly on the far inland lakes of America as ever naval war was fought by the sailors of England on the ocean. There would be as little reason for abandoning Lake Huron as for abandoning Quebec. The latter we seem to have determined not to do unless we bid farewell to all the continent; but Upper Canada would then be as defensible as is Quebec. The voice from the Western province, which has been heard remaining faithful and true when told that province would be left an undefended battle-ground to be desolated by the enemy, would give no undetermined sound with such a guarantee for its security. This great essential work constructed, all the wants and conditions of the country can be met. It would give backbone and solidity to the whole province. From it as the base of operations, the frontier itself can be secured in all essential points, and works, dangerous, if not disastrous, if undertaken in its default, become of advantage and almost secure. Either the Welland, the Georgian Bay, or Rideau lines can be made to admit fleets or gunboats into Lake Ontario, and even without these, the defence of that lake can be independently provided for.

These are, I think, sufficient reasons for placing this work not only above any competitor, but for taking it altogether out of the category, for comparison. It alone is a work of thoroughly imperial interest. Such is its national and military value, though a work commercial and civil in its nature, that I do not believe it is too much to say, that it is the best work of defence that could be erected in Canada, and even one without which that defence might possibly prove as ineffectual and the attempt as impolitic as they have been assumed to be.

I had hoped to enter on some further details of this very interesting route, but the time for which I could hope to command your attention, and for which I am allowed to solicit it, forbids. I must therefore confine these to the Appendix, and will only add that His Excellency the Commander of the Forces, Administrator of the Government, and, I believe, also the Admiral of the North American station, whom I had the honour of being invited to accompany over the route, are as favourable to its construction, and earnest for it, I think, on the grounds I have endeavoured to place before you, as I can possibly be. The

length to be artificially improved is 58 miles, which includes, however, the reconstruction of the Lachine Canal. The aggregate lockage is 693 feet. The cost has been estimated from two and a half to five millions sterling, according to the views on which the respective estimates have been based. It must be remembered that this is an outlay that has been advocated, and advocated ably, on commercial grounds alone; that it is a sum that would certainly bring a direct measure of return, besides conferring security upon, and thereby wealth throughout the province.

The objection to leaving it to be constructed as a commercial work lies in the rival routes to which I have adverted. Under that aspect it has to contend against local interests and sectional jealousies; against the rivalry especially of those interests least favourable to British connection and most induced to seek personal wealth, and to care little for any national existence. It would besides traverse a new country, along the immediate banks of which not only is there no population at present, but the very formation which renders it supremely valuable for military purposes, precludes the possibility of its becoming the seat of a population of similar extent to that occupying the comparatively alluvial lands of the frontier. It derives its monetary value, more particularly between Lake Huron and the Ottawa, as a channel of transit from the west.

I opened this paper by calling your attention to the fact that the water system of the St. Lawrence, as a whole, is but one of several that traverse the length and breadth of Northern America. That branch of the St. Lawrence navigation which I have last brought to your notice is in the direct line to the west. In point of fact it would shorten the distance to the west by nearly 400 miles. The richness of that west has not been overdrawn. The facts of * Minnesota are before us, and we hear continually of unexpected sources of wealth in rugged and barren districts beyond, that may well create some astonishment that the mineral wealth of Canada in Lake Superior is almost untouched. True, the possessors of the soil of interior British America seem still to deem that they can reap no present profit from it save by its

* "What cotton is to the South, wheat is to Minnesota. If cotton is king, surely wheat is queen. In 1860, the wheat crop of Minnesota amounted to over five million bushels, being nearly five times greater than they raised in the New England States. The yield has been steadily increasing each year, and now the crop for 1865 will not fall short of twelve million bushels, an average of twenty-seven bushels to the acre. In Ohio, the largest crop ever grown (that of 1850) only yielded seventeen and one-third bushels to the acre, while the average for ten years was but twelve and a half bushels. In Iowa, which is generally considered one of the richest agricultural states in the west, the crops do not average more than fourteen bushels, while in New York and the New England States the yield is about 40 per cent. less. When you take into consideration the fact that there are not more than 250,000 inhabitants in Minnesota, this yield of grain seems enormous. Forty-eight bushels of wheat for every inhabitant, man, woman, and child! Why, Egypt in its palmiest days could not boast of more than this. The valley of the Mississippi overshadows the valley of the Nile, and Pharoahs are nowhere. The superior quality of Minnesota wheat is shown in the weight of the grain, and its suitableness for milling purposes. It weighs from 62lb. to 70lb. to the bushel, while in Ohio and Pennsylvania it averages from 50lb. to 60lb."—*New York Herald.*

seclusion; but their predecessors thought the same, when they virtually held the destinies of many now prosperous components of the republican states and of several British provinces in their hands. They were in error then; their successors may be so now.

Be this, however, as it may, I have shewn you how nearly the great waters are everywhere connected, and the time is probably not distant when, under whatever circumstances, steamers on the midland system may approach to the foot of the Rocky Mountains of the west from Fort Garry, the centre of the northern continent; and when others, plying on the rivers and lakes intervening between that country and Lake Superior, may complete a traverse of two-thirds of the continent; and as the country of the Athabasca is unquestionably attractive, and the Peace and Mackenzie Rivers are with scarcely an obstacle to their navigation, even that northern system may become peopled in its southern portions, and the north be the resort of their whalers in the Arctic Ocean. Who shall say these several systems may not become connected? Certainly they would have been so ere now had the efforts of men been only directed to the energies of life, as they are to necessary vigilance for the powers of mutual destruction.

The great interior has been offered to Canada, and she has accepted the offer. I do not myself think the acceptance of that offer has on her part been judicious, and for this reason, that there is even a superabundant call for her exertions within her present limits. To the works we have briefly reviewed must be added the intercolonial railroad, and the aggregate is enough to tax her energies, if not to surpass her power. The injury and disparagement she has received from the continual addition to the peopled territories of her neighbours while her own west has been hermetically sealed, no doubt served to determine her reply; but if the terms of the acceptance exceed her power at present, those unquestionably best informed upon the subject are most alive to the now imminent danger of delay, and their conviction is both strong and decided, that the security of Canada, and indeed the ultimate presence of England both in the Atlantic and the Pacific, is involved in the speedy action of the Imperial Government to secure an organised government, the security both of person and property, for Central British America. I think, therefore, it is to be most earnestly desired, that the question of the defence of Canada may be dealt with on something more than mere technical terms; not viewed as a question of a regiment more or less in this place or another, nor of a barrack or a storehouse here or there; not left to be disposed of piecemeal, if I may be allowed the expression, but that it may be merged in the greater question whether the provinces existing or to be born, can remain in their allegiance with benefit to us and to themselves; and, if the answer be in the affirmative, that such measures may be adopted in the interests of America, as well as of England, as will, humanly speaking, place the issue beyond reach of cavil or disturbance. I can picture to myself no greater perils to peace than arise from unpreparedness for war and from indecision.

I regret that I cannot, within the limits of our time, enter upon any considerations relative to the execution of the navigation by the Ottawa

and French Rivers; and also that I have been prevented for the same reason from giving details of the great existing works; but I hope I have judged aright, that it would be most useful as well as most acceptable to present to the best of my ability the outline or foundation of the entire subject, rather than to overload a section with particulars which could not even then be made sufficiently minute.

More than all I could have wished, had time permitted and the occasion fitted, to have sought to draw your attention to the difference involved in maintaining or in abandoning British dominion in the presence of the adjoining republican states of America. I refer not now to imperial greatness, though I fully believe that England can maintain no greatness, possibly not even her independence, unless she maintain her imperial possessions; but I refer to something higher and greater than the instrument, that to which dominion ought to be the instrument, and to which, in the case of England more than of any other power, I believe it has been the instrument, I mean—the moral, social, and individual effects of right power lawfully established. I may not dilate upon this subject, time and circumstance forbid; but the history of the past and the events of the day speak, for me more strongly than mere language could. I will only say, so far as I have known, that this difference is more highly appreciated throughout America than here. There the contrast is more familiar. It is the cause alike of the attachment to England, and of its opposite, which respectively distinguish British America and the republican states. It is now more than twenty years since I was the guest of one who had sought not the towns of the severed republics, but the forests of the colonies of England, for his future home. Looking from the window of his house on to the farm and fields which he had cleared, he told me that he had, it was then, I think, five-and-twenty years before, come to that spot with, in his own words, as well as I remember, an axe upon his shoulder and God above him as his trust. He had lived on in that trust and confidence: he understood its origin and its strength. Such are the men who, in the words of Jeremy Taylor, have lived "stewards of creation, ministers of Divine Providence, and kings and priests to God," and such I have ever found the most attached to British rule and its perpetuance; and that in proportion as they felt and acted out such principles. They entertain a staid conviction that the earthly strength of human hope is vested in England, and springs from her principles, that these have been the source of all her greatness, and that that greatness ought to be the sacred guardian of those principles. It is this conviction, not the lust of wide spread imperial dominion that is the life of their affection. In truth England stands conspicuously alone amidst the nations of the earth in having nationally received, avowed, and maintained those principles which we, from the very strength of our adoption, term old English. Then how explain that feeling towards England which is the strongest * characteristic of the severed colonies,

* Extract from report by the Chief Superintendent of Education, Upper Canada:—

"In regard to the exclusion of American books from the schools, I have explained

except by the evidences which time but too bountifully affords. The subjected sovereignties of the south are not the only testimony that there liberty is but too frequently the by-word for intolerance, equality the muzzling of excellence, and brotherhood the motto of oppression. They who learn this lore from examples living out the difference, will come back seeking to enlist you with no common earnestness, and they will entreat you,

If you value the principles of England, hold her territories fast.

" that it is not because they are foreign books simply that they are excluded, but " because they are, with very few exceptions, anti-British in every sense of the " word. They are unlike the school-books of any other nation, so far as I have the " means of knowing. The school-books of Germany, France, and Great Britain, " contain nothing hostile to the character of any other nation. American school- " books, with very few exceptions, abound in statements prejudicial to the institu- " tions of the British nation."

We hear, occasionally, a great deal about "America for the Americans." It is not a little singular that the only persons possessing the slightest claims to any exclusive right to the name of Americans, or to the possession of the soil, should be termed "*Indians*," and should be daily more and more dispossessed of life, as well as land, by these exclusive European republicans.—M. S.

APPENDIX.

A. Elevations, Areas, &c., of the Great Lakes, and of certain of the Minor Lakes of Canada.

Name of Lake.	Elevation above tide-water at Three Rivers.	Dimensions.			Area in Square Miles.	Remarks.
		Extreme width.	Extreme length.	Mean depth.		
	Feet	Miles	Miles	Feet		
Superior	598	160	400	900	32,000	NOTE.—The elevations of all the Canadian lakes are made to refer to TIDE WATER AT THREE RIVERS, the highest point at which the ebb is perceptible in the St. Lawrence.
Michigan....	578	80	330	900	17,000	
Huron.....	574	160	260	900	21,000	
Erie.....	564	60	240	120	7,500	High spring tides at QUEBEC rise 19½ feet.
Ontario	234	55	190	600	6,300	Average spring tides at QUEBEC rise 17 feet. Neap tides at QUEBEC rise 11½ feet.
Nipissing....	634	..	..	..	..	Discharges by the "French River" into Lake Huron.
Simcoe.....	706	..	..	..	..	Discharges by the "Severn" into Georgian Bay, Lake Huron.
Rice Lake ..	599	..	..	..	..	Discharges by the "Trent."
Balsam Lake.	823	..	..	..	..	Balsam Lake is the head of the "Trent Waters," which discharge into the Bay of Quinté, Lake Ontario.

W. S.,
Montreal, 7th Oct., 1865.

Obligingly furnished by Mr. Walter Shanly.

B. MEMORANDUM RELATING TO THE CANADIAN CANALS.

Welland Canal.

Total amount expended to 1862.....	$7,200,000
Main line from Port Colborne, on Lake Erie, to Port Dalhousie, on Lake Ontario	28 miles
Feeder Branch, from Grand River at Dunnville to "The Junction"	21 „
Broad Creek Branch to Port Maitland, on Lake Erie	2 „
Total length	51 „
Total rise from Lake Ontario to Grand River Level	338 feet.
Number of locks (ascending)	26

The Grand River level is 8 feet above Lake Erie; consequently, vessels ascending from Lake Ontario, have to lock down from the summit into Lake Erie.

The deepening of the summit level is now being proceeded with, so as to admit the water from Lake Erie. When this is accomplished, the Grand River feeder, which at present is the only source from which water is supplied, can be dispensed with. This work will probably be completed in 1866.

Size of Locks.

Between Lake Ontario and St. Catharine's (2), 200 feet long, 45 feet wide, 10 feet deep.

Between St. Catherine's and summit (24), 150 feet long, 26½ feet wide, 10 feet deep.

Entrance locks at ports Colborne and Maitland (2), 200 feet long, 45 feet wide, 10 feet deep.

ST. LAWRENCE CANALS.

Total amount expended to end of 1861 ..... $7,300,000

These canals comprise:—

The Lachine	having	5 locks =	44¾′ rise,	8½ miles long
The Beauharnois	„	9 „	82½′ „	11½ „
The Cornwall ..	„	6 „	48′ „	11½ „

The Williamsburgh, viz.:—

Fanrus Point ..	„	1 „	4′ „	¾ „
Rapide Plat....	„	2 „	11¼′ „	3¾ „
Iroquois .. / Junction .. / Gallops....	„	3 „	15¾′ „	7⅞ „
Totals.....		26	206½	43¾

Size of Locks.

200 feet long, 45 feet wide, 9 feet deep.

ELEVATIONS FROM TIDE WATER TO LAKE ERIE.

Montreal and tide water at Three Rivers.....		13 feet.
Lake Ontario and Montreal, viz.:—		
St. Lawrence Canals, say	206 feet	
Intermediate fall.....	16 „	
		222 „
Lake Erie and Lake Ontario		330 „
Total		565 „
Lake Huron and Lake Erie, about		8 feet.

Obligingly furnished by Mr. Walter Shanly.

C. Abridged Extract from Mr. T. C. Clark's Report.

Taken from "Eighty Years' Progess."

	Distances.		Levels.		Cost.
	Rivers and Lakes.	Canals.	No. of Locks.	Lockage.	
	Miles.	Miles.		Feet.	
Lachine Canal	..	8·50	5	43·75	
Lake San Louis	13·31	..	..	..	
St. Anne	..	1·19	1	1·00	
Lake of Two Mountains	24·70	..	..	..	
Carillon to Grenville	7·73	5·	7	58·50	
Green Shoals	..	·1	..	..	
Ottawa River	55·97	..	..	..	
Chaudiere River and Des Chènes	3·75	2·61	6	63·00	
Des Chènes Lake	26·69	..	..	..	
Chats	1·70	·60	5	50·00	
Chats Lake	19·28	..	..	..	
Chenauxt to Black Falls	18·32	1·05	11	104·00	
River and Lake Coulange	24·93	..	..	..	
Chapeau and L'Islet	4·85	·14	2	18·00	
Deep River	33·58	..	..	..	
Joachim to Mattawan	51·74	2·26	14	148·20	
River Mattawan	16·22	1·08	11	144·00	
Summit Level Cut	51·15	5·97	..	..	
French River	47·52	·82	7	77·00	
Totals	401·44	29·32	64	665·70	$12,057,680

N.B.—Scale of navigation, 250ft. × 45ft. × 12ft.

D. Table of Comparative Distances.

	Miles.				Lockage.		
	Lake.	River.	Canal.	Total.	Up.	Down.	Total.
Welland	1145	132	71	1348	..	535	535
Toronto and Georgian Bay	775	155	120	1050	130	675	805
French River and Ottawa	575	347	58	980	83	615	698

E. Mr. MacAlpine's Table, forming Basis of Mr. Shanly's Estimate.

	Cost of movement per ton per mile.
Ocean—Long Voyage	1 mill.
Short „	2 to 4 mills.
Lake—Long „	2 „
Short „	3 to 4 „
Rivers—Hudson and Lake	2½ „
St. Lawrence and Mississippi	3 „
Tributaries of Mississippi	5 to 10 „
Canals—Erie enlargement	4 „
Other large canals, but shorter	5 to 6 „
Erie, ordinary size	5 „
With great lockage	6 to 8 „
Railroads—Transporting coal	6 to 10 „
Not ditto, favourable grades and lines	12½ „
Steep grades	15 to 25 „

Add tolls, which swells the cost on Erie as it is to 14 mills. per ton per mile.

Mr. Shanly's Estimate to Montreal.

		Time. Hours.
1. Welland and St. Lawrence Canals:—		
Lake navigation, 1145 miles at 2 mills.	$2.29	159*a*
River „ 132 „ 3 „	.40	24*b*
Canal „ 71 „ 8 „	.57	13*c*
Net	$3.36	196
2. Toronto and Georgian Bay:—		
Lake navigation, 775 miles, at 2 mills.	$1.55	
River „ 155 „ 3 „	.46	116*a*
Canal (Toronto and Georgian Bay) navigation, 77 miles at 12 mills.	.92	40*b*
Canal (St. Lawrence) navigation, 43 miles, at 8 mills.	.34	20*c*
Net	$3.27	176
3. French River and Ottawa:—		
Lake navigation, 575 miles at 2 mills.	$1.55	115*a*
River „ 347 „ 3 „	1.04	19*b*
Canal „ 58 „ 12 „	.70	18*c*
Net	$2.89	152

Based on Mr. MacAlpine's minimum for lake and maximum for rivers: not unduly *favourable* to Ottawa.
a, lake and river. *b*, canal. *c*, lockage.

1. Welland Route:—			
Chicago to Caughnawaga (deduct Lachine charge)			$3.12
Caughnawaga canal	33 miles at 8 mills.	$0.26	
St. John's to Whitehall River and Lake	120 „ 3 „	.36	
Champlain Canal	65 „ 8 „	.52	
Hudson River Walesford to New York	155 „ 2½ „	.39	
			1.53
Distance..	1,721 „		$4.72

2. Toronto and Georgian Bay :—	
Chicago to Caughnawaga, as above	$3.20
Caughnawaga to New York	1.53
1,423 miles.	$4.73
3. Ottawa and French River :—	
Chicago to Caughnawaga	$2.82
Caughnawaga to New York	1.53
	$4.35

MR. SHANLY.

Capitulation :—	
River and Lake navigation	372 miles
Canal (including Lachine)	58 „
Total	430 distance.
Rise, Lake Huron to Summit	83 feet
Lockage	83 „
Fall, Summit to Montreal	642 „
Lockage	615 „

Total lockage, 698 feet.

Fifty-eight miles at $370·000.
For Removal of shoals, $2·250·000 lump sum,
£4,931,506 sterling.

Season of Navigation—On Welland	209 days
On route, say	169 „

Lives lost on St. Lawrence, 1857, $1·387·935,
Lives 490.

Mr. EDWARD W. WATKIN, M.P.: I am sure we are unanimous in thanking Colonel Synge for the excellent paper he has read on a subject of so much interest to us. Whether we are familiar with the geography of this vast American continent or not, it has often struck me, with regard to our statesmen, that if their scholastic preceptors had only taken a little more pains with them with reference to the possessions of the British Empire, we should have had fewer mistakes in the commercial and other treaties which have been made. And I think, with every respect for Lord Ashburton as a man of great distinction, and of great position, if he had only known a little more of the proper geographical boundaries of our empire, he certainly would not have given away that piece of Maine, which I think is a little larger than Scotland, on the mere showing of a map, which, undoubtedly, now is recognised as a forgery. I think Colonel Synge, apart from dealing with the question of the colonisation of Canada, and apart from pointing out the shortest route between Europe and the great corn-growing districts of the West, has entered upon a question which is of the greatest imperial moment, viz., whether we are to keep, if not extend, the boundaries of the empire, or whether we are to give up, piece after piece, possessions which, populated some day or another, ought to contribute largely to the glory of our country, merely to conciliate a Power occasionally hostile, and which would be peaceable in proportion as we held our own. Now, I am somewhat familiar with portions of these great regions, and it seems to me that no mistake could be so large, no mistake could involve such disgrace, as that which would be committed by the legislature of this country if ever they took away the influence of the British Crown from the northern part of North America. What is our position? Let us look at it first, physically. We possess more than half that great northern continent of America, which stretches from the Gulf of Mexico to the Arctic regions.

We have within the dominions of the Queen a larger portion of accessible territory by far than that which is possessed at present by the United States. We have a climate there which, though as regards some portions of it, may be rigorous, is a climate which makes men strong, and able, and enduring, and makes a nation hardy and brave. The proposal is that, in order to provide for some temporary peace with the United States, that territory shall be abandoned; and the British Empire shall in future, I suppose, be described by geographers as England, Ireland and Scotland, and the Isle of Man. I am one of those who believe in a large country. I should be sorry, indeed, to be the citizen of a little one. I go in for as much territory as we have got, and for as much more as we can get; because I believe the liberty enjoyed by our country is the greatest and best liberty which human history has ever been able to record; I believe our civilisation is the highest and purest civilisation which, at present exists upon any portion of the globe; and I believe the great mission committed to us, in consideration of the great power and riches we possess, is to extend that civilisation into every portion of the globe. Then, I come to the question of the physical means to secure this. There is no physical agency so great as intercommunication. What Sicily was in a small degree to ancient Rome, the Western States are to this country and to Europe at large. There are the great granaries, within ten days of Europe, which are to feed our population, increasing beyond the physical resources of our own country. Under these circumstances, Colonel Synge proposes that we should shorten the distance between this country and those great corn-growing districts of the West by 400 miles at an expense of £3,000,000 of money. I do not know whether he proposes that Mr. Gladstone should provide the money in any of his budgets. Mr. Gladstone is a most able Finance Minister, but I am afraid with his principles of economy that the money is not likely to be obtained from that source. Colonel Synge proposes that the thing shall be done in concert between this country and Canada, and the North American provinces. Of course, the vast property which exists in that portion of the continent of America would be practically mortgaged in order to secure this great work. Nobody can complain of that, except the gentlemen who seem to be always ready to advocate the interests of the United States, forgetting the extent of the territory we have at our command, and the devotion, industry, and courage of the four millions of people who at present inhabit that portion of the territory which lies between Lake Superior and the ocean. In addition to this, the Hudson's Bay territory has to be considered. There we have a great prairie, the only one unoccupied upon the American continent. We have that prairie intersected by rivers which run east and west, and give facilities of communication east and west; a prairie with which those of Illinois and Ohio and the other states of America are not to be compared. That brings us back to the question, do we still intend to retain these provinces of North America? For myself, I am for retaining all the territory we have got. Just as in this country, and in every old country, a man is received and respected as a solid man, who, in addition to his money, his business, and his moveable property, possesses a solid estate, a portion of the soil of his country, so, I believe, that every nation is prominently great in the eyes of all surrounding nations, by having, not merely a large business, not merely large customs' duties, considerable trade, large balances in banks, limited liability companies, and everything of that, kind; but a broad and constantly increasing portion of that earth's surface which after all, is the mother and source of all the wealth that surrounds us.

Mr. GZOWSKI, C.E., of Toronto: My friend, Colonel Synge, has asked me to speak. He has covered the ground so cleverly, and Mr. Watkin, whom I have the pleasure of knowing, has advanced views so thoroughly Canadian that there is very little left for me to say. I do believe, with Mr. Watkin, that the real greatness of an empire lies not in chattels, but in real estate; and that it would be a cruelty to the Canadians to make them feel that they are to be given up, and handed over as property of so much value to those who have no good feeling towards this country. Colonel Synge's description of the lakes and rivers, and the facilities of communication is very correct, and may be relied upon in every respect. As an engineer, I have gone over every inch of the ground he has described, and I can speak from personal knowledge that he has been guilty of no exaggeration. With reference to the construction of the Ottawa Canal,

that is a question which must be more minutely examined; but I believe the figures mentioned are not very far astray, as Mr. Watkin has truly said, it is a question whether in view of maintaining that large territory, it is worth while to incur an expenditure to make the Canadians feel that they are part and parcel of the British Empire.

The CHAIRMAN: If no other gentleman wishes to address the meeting, I have to move the usual vote of thanks to Colonel Synge for the very elaborate paper which he has read this evening. The questions he has placed before us are of such vast magnitude, that I, who do not pretend to have any acquaintance with them, shall certainly not detain you by any observations of my own. We have also heard a very patriotic and eloquent speech from Mr. Watkin. I think Mr. Watkin takes a view which is held by a great many of our fellow-countrymen, that we should hold what we have got. But when he goes further and says we should get what we can, I confess that I cannot go so far as that with him. Every naval officer must be well aware that, although we have a great many points on this globe that are most useful to us as stations, yet our colonies are now so very numerous, that to add to the points which, in the event of a war, we must defend chiefly by our fleet, would be to impose liabilities upon the country which it is desirable to keep within due limits. If we were to follow up the dictum of Mr. Watkin and get what we can, we should have such a large extent of territory, and so many points to defend, many of which are not easily defended, that we may find it desirable to reduce rather than to increase the number of our dependencies.

LECTURE.

Friday, April 20th, 1866.

GENERAL THE HON. SIR E. CUST, K.C.H., in the Chair.

ON THE BEST METHOD OF ARMING, EQUIPPING, AND MANŒUVRING INFANTRY.

By General WILLIAM H. MORRIS, of the United States of America.

Mr. CHAIRMAN and GENTLEMEN,—The object of the paper I shall have the honour of reading to you this afternoon is to invite your attention to improvements in arms, equipments, uniforms, and manœuvres of infantry, drawn from the experience of the American armies in the recent war.

It was with much hesitation that I consented to appear before this Institution; for your army contains so many officers of large and varied experience, devoted to the best interests of the service, that it seemed almost presumptuous in me to offer suggestions for increasing the efficiency of troops. But, considering that every great war makes new developements in military science, and that every general change of arm leads to new manœuvres, I feel sure you will be interested in hearing what modifications of previously-established principles have resulted from our late campaigns.

Having been educated at the National Military Academy at West Point, I was assigned to a position of importance at the commencement of the war, and was honoured by successive promotions until I became a Brigadier-General. It devolved upon me, personally, to prepare troops for the field, and to instruct officers in their military duties; and this led to my giving such close attention to the details of the service that I observed many defects which might otherwise have escaped my notice.

During the war I was constantly in the field, and took an active part in many of the severest engagements of the Army of the Potomac; I had, therefore, every opportunity of studying and practising improvements designed to facilitate the march of troops along narrow roads, and to provide for manœuvring in a rough country abounding in woods and streams.

I beg your indulgence for this personal allusion, which seemed

necessary to explain how I obtained a practical knowledge of the subjects I propose to discuss on this occasion.

THE LATE AMERICAN CAMPAIGNS.—The rifled musket, carbine, and cannon having been used with powerful effect by the American armies in the late war, radical changes in the management of troops became absolutely necessary.

It would be impossible for me to describe, in the short time at my disposal, the many important improvements in arms and projectiles; in military roads, bridges, and construction trains; in methods of communication by flag and light-signals, and portable telegraphs; in the organization of departments and means of transport; that enabled us to move our large armies as readily, and almost as rapidly, as the single division.

REFORMS SHOULD COMMENCE WITH INFANTRY.—But, as the decisive blows of a war must be struck by infantry, and as the success of infantry depends mainly upon the rapidity of marches, celerity of movements when going into battle, and physical endurance of the men; I am satisfied that I cannot better improve this occasion than by making some remarks on the best method of arming, equipping, and manœuvring troops of that branch of the service. In all general changes it has been found advisable first to regulate and establish the infantry, and then to modify the other arms accordingly.

THE RECRUIT "FULLY EQUIPPED."—I remember, with a shudder, the infantry recruits as they appeared before the inspector at the first call of the President for troops. Itinerant pedlars could scarcely have been more encumbered with their packs than were these inexperienced men with their knapsacks (crammed almost to bursting), as they staggered along the muddy roads, often sinking from exhaustion. A few days on the march taught the impossibility of transporting such weights, and the darkness of night was taken advantage of to throw away overcoats, underclothes, and even blankets. The armies of the South set the example by giving each man one suit of clothes only, at a time, which had to last at least one campaign. Officers who were admired for the correctness of their costume in garrison were obliged to content themselves with such uniforms as would best protect their persons from the cold and rain, regardless of appearances. Our most distinguished generals wore the ordinary overcoat, and used the saddle and bridle of the cavalry private.

The incessant activity of our campaigns made careful *toilettes* nearly impossible, and our corps commanders would sometimes pass so covered with dust that the colour of the hair could not be distinguished. The military profession has ceased to be one of display in the field. The army that would win success must be willing to march all night and fight all day, must subsist upon such plain food as can be best transported, must eat beef before it has been killed an hour, must ford streams, endure storms, sleep on the ground, watch with unceasing vigilance, and disregard dirt.

ARMY TRAINS.—It is always an important problem how to reduce an army train to its minimum; for nothing so seriously impedes the movements of troops as the care of many waggons. It was estimated

that the train of the army of the Potomac at one time would have reached, in a single column, some two hundred miles. The absolute necessity of reducing it led to the discarding of all comforts. Shelter-tents only (the French *tentes d'abri*) were issued to the troops, and these they carried on their backs. Live cattle were substituted for packed meats, so that the rations transported themselves. The men carried coffee, sugar, salt, crackers, and extra ammunition in their knapsacks; and did not carry razors, soap, brushes, looking-glasses, blacking, pumice-stone, or pipe-clay. This "light-marching order" enabled an army of a hundred thousand troops to abandon a base for twenty days at a time, and to accomplish rapid marches of miles by hundreds.

Clothing.—Too much attention cannot be paid to the clothing of troops, and especially of infantry. The stout, broad-soled, low-quartered, low-heeled shoe has been found the least liable to injure the feet, and fatigue the wearer. The boot is too heavy; and, besides rubbing the heel, is, when wet, difficult to take off and often impossible to draw on again.

The sock should be of thick soft wool. The leg to the top of the calf should be protected with a close-fitting covering of leather or strong canvas. For the cavalry-man, the legging should reach above the knee to prevent chafing.

The pantaloons both for foot and mounted soldiers, should be large round the thigh, as it has been found that when so made, the friction is less than when they are tight, besides their being more comfortable in all weathers and lasting longer. They should not extend below the small of the leg under the knee, where there should be a band with a button. This saves unnecessary bulk under the legging, and prevents the cloth from rubbing the knee-pan, which in long marches is fatiguing.

The jacket should be loose about the shoulders and arms, but close-fitting at the waist and wrists. It should be just long enough to cover the abdomen; if lower, it is in the way, besides being a waste of material and suggesting the idea of a skirt cut off.

The hat should be as light and soft as possible, in order not to produce headache, which renders the eye less vigorous in the important duty of aiming; and to serve also as a night-cap in cold weather, when troops are obliged to sleep in the open air. As it is necessary to protect the eyes from the glare of the sun, the nape of the neck from his heat, and from rain, and the ears from being blistered in hot weather, there should be a narrow rim extending entirely round. This gives us the soft felt, water-proof, low-crowned hat. An objection may be urged against it, that it has not a military appearance. It certainly does not look so formidable as the metal helmet still worn in Europe by heavy horsemen, nor does the light Zouave jacket look so dazzling as the metal cuirass of the cavalry; but if we study utility, we must reject these relics of the past, for they seriously encumber the wearer and are no protection against the resistless bullet. Why a man, because he is a soldier, should be compelled to wear costumes that disregard all the suggestions of common sense and the warnings of experience, is among the mysteries still to

be solved. What hunter or explorer, for example, could be induced to wear, habitually, the enormous head-coverings of bear-skin which seem to be so carefully cherished by some of the best troops in Europe. The chief argument in their favour appears to be that "they make the men look tall." There is certainly no practical benefit from this, and height, gained by the apparent enlargement of the head, does not seem, to an eye unaccustomed to it, to be desirable. Troops wearing these large hats would have much trouble in passing through thick under-brush; and in a high wind would find it very difficult to retain them upon the head. In close order for infantry, the hats of the front-rank men are in the way of the men in the rear rank; and when the heads are inclined in order to aim, the hats do sometimes drop off. The true principle is to dress men in garrison as they should be dressed in the field.

The modification of the bear-skin cap recently approved for your Fusilier regiments of the line, seems to combine many of the conditions required for a serviceable head-dress, and at the same time is handsome and soldier-like. Each succeeding pattern will, no doubt, be still further modified, until the cap is reduced to its most convenient size.

In the desire to simplify, however, all ornamentation should not be discarded. Colours, facings, badges, and other means are required to distinguish troops of the several arms, and the different grades of commissioned and non-commissioned officers. Much taste and good sense may be displayed in the designing of uniforms. The grade marks should be simple and easily distinguished. The hat is one of the most important places for the indication of rank, as the overcoat covers the mark elsewhere. The coat collar is not a good place, for the beard often completely conceals it. The points of the shoulders, and the sleeves, have not this last objection, and marks placed there are highly ornamental.

The soldier, then, should be clothed so as best to secure his comfort, health, and freedom of motion; and the ornamentation should have for its object the simplest means of distinguishing the arms of the service, the rank, and the brigade organizations. Braidings and cordings of silk or worsted are sufficiently conspicuous for this purpose, and are more enduring than gold lace. Rain is even more injurious than cold, and the over-garment should be water-proof. The American infantry were supplied with an india-rubber blanket, which served also as a cape, and was provided with buttons and holes, so that two or more men could unite their pieces and form shelter-tents.

It has often been discussed, whether uniforms of bright colours tend to increase casualties. In the case of troops of the line, who act in compact numbers, they do not seem to have any material effect; but for skirmishers the less conspicuous the dress is, the better. A reasonable amount of gay colouring, display of flags, and ceremonious respect for rank, should always be preserved and encouraged. They add much to the romance and attraction of the military profession, and aid in developing a proper feeling of pride and emulation. So many simple systems of ornamentation fully answering all the required conditions, have been designed, that a reference to works already published will enable a board at any time to select proper uniforms.

Fig. 1.

1st Corps, 1st Div.n

Fig. 2.

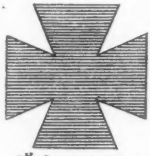
2nd Corps, 2nd Div.n

Fig. 3.

3rd Corps, 3rd Div.n

Fig. 4.

Fig. 5.



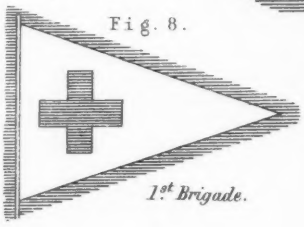
5th Corps, 3rd Div.n

Fig. 6.
IIth Corps
2nd Div.n

Fig. 7.

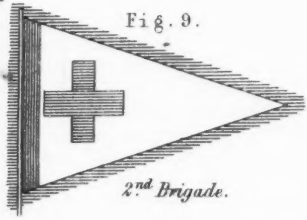
6th Corps, 1st Div.n

Fig. 8.



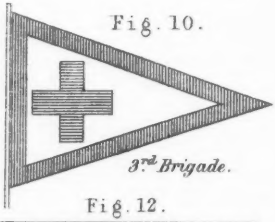
1st Brigade.

Fig. 9.



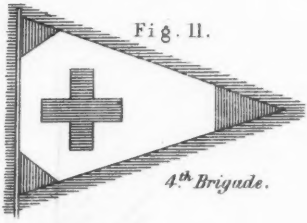
2nd Brigade.

Fig. 10.



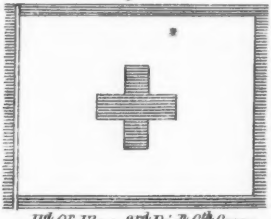
3rd Brigade.

Fig. 11.



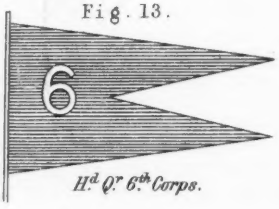
4th Brigade.

Fig. 12.



Hd Qr Flag 3rd Div.n 6th Corps.

Fig. 13.



Hd Qr 6th Corps.

Red is shewn thus ▭ Blue thus ▬

J. Johbins

Useless weight, expense, and perishable attachments should, of course, be carefully avoided.

Corps Spots and Badges.—The necessity of distinguishing, by some simple means, the soldiers of the various divisions and corps, led to the adoption of spots and badges, which will always be found of use, and can be applied without delay on the organization of a corps.

Each corps commander having selected his spot, say the plain cross, as in the case of the Sixth (Plate viii, fig. 7), the formula was as follows:—The first division wore upon the hat a red cross; the second division a white cross; and the third division a blue cross. The spots were usually cut out of cloth by a punch, although metal spots were allowed in some instances. Every man and officer was required to wear his corps' spot of the colour of his division; and its use was found to greatly diminish straggling, as a man away from the command to which he belonged was at once observed and returned.

Staff officers attached to the corps head-quarters wore the spot made up of all the division colours. Division head-quarter flags were square (Fig. 12); brigade head-quarter flags were triangular (Fig. 8); and corps head-quarter flags were swallow-tailed (Fig. 13). The white spot was on a blue ground, and the red and blue spots were on white grounds. The first brigade had for the head-quarter flag, the same ground as that of the division (Fig. 8). The second brigade flag was distinguished by a stripe some six inches wide (Fig. 9), along the lance, and of the colour not used in the spot or ground. The third brigade flag was entirely surrounded by a border (Fig. 10). A fourth brigade was distinguished by a triangular colour at each of the three corners of the flag (Fig. 11). It will thus be observed that, the formula being the same, the spot in the centre only was changed for each corps. Any figure will answer; but it is well to select such as can be readily cut with punches, and have names, such as the square, the circle, the cross, the crescent, &c. (Figs. 3, 1, 5, 6, 2).

Equipments.—Many regiments went to the field with the cartridge-box carried on the waist-belt; but the weight upon the intestines so frequently produced rupture, that the shoulder-belt was generally restored. The French soldiers, in some instances, carry on the waist-belt, the cartridge-box, the bayonet, and a sword. Such pressure upon the most easily injured portion of the body would, I am sure, very soon destroy men on a long march.

The cartridge-box might be much improved; it is very inconvenient to raise the cover every time a cartridge is required. There is a simple contrivance which has met with favour wherever known, by which an arbitrary motion delivers into the hand a cartridge at each turn of a wheel, from the bottom of the box. The cap-pouch is far from perfect, and the difficulty which an excited soldier, or one with cold fingers, has to pick up the small cap, and place it properly upon the nipple, makes some mechanical means for capping desirable. The sportsman uses a spiral magazine, which would seem better than the ordinary method.

The haversack, if made of canvas, permits grease to injure the clothes; if made of impervious material, like enamelled cloth, this disadvantage is prevented.

The best material for the canteen appears to be tin, which is light, and yet sufficiently strong for the purpose; but the unpleasant taste it imparts to water is an objection. The best form of canteen is the French, which is shaped to conform to the part of the person where it rests.

The knapsack is the most faulty of the several articles a fully-equipped soldier is required to carry. It is generally hung upon the shoulders with a complication of straps which distress the chest, and is made unnecessarily burdensome by the leverage caused by its thickness. A light steel frame, conforming to the shape of the back, with padded hooks to rest upon the shoulders, and merely a strap for the waist, would prevent much of the present drag and trouble of adjustment. The knapsack should be as thin as possible, even at the expense of greater width. The top, sides, and bottom might be lined with some light wood, or other material, which would preserve the shape; but the flat sides should always be soft and yielding. The blanket is better carried rolled on the top and sides, than folded and inside. Since writing the above I have seen the knapsack recently perfected by Sir Thomas Troubridge, and at present (as I understand) being practically tested in your service; this is constructed on the principle of the yoke, and, having no straps crossing the chest, seems likely to solve what has always been a difficult problem. The knapsack should not ordinarily contain more than one pair of shoes, one pair of socks, one pair of drawers, one under-shirt, a small piece of soap, a small bottle of oil, and a few pieces of cloth to clean the rifle. The hair, if kept short, requires no comb or brush, and is sufficiently dressed when washed with the face. In the field, no soldier should he allowed to shave. In changing the stations of troops, a moderate allowance of personal effects should of course be transported for each man.

Bayonets.—The sword-bayonet is passing rapidly out of favour. It is heavy, and inconvenient in the scabbard, striking the leg in marching, and is much in the way when kneeling to fire, besides being heavy on the rifle. It was intended to supply the length cut off the barrel in the short rifle; but as the bayonet is effective chiefly in the charge, and the long barrel gives better practice, and is safer for the two rank formations, the rifled musket with the triangular bayonet has become the general arm.

Breech-loaders.—The opinion that all small arms should be breech-loaders is daily gaining ground. The more rapidly men can fire in cases of emergency, the more willing they are to reserve their fire. The actual conflict in many of the recent engagements did not last more than a few minutes; in such instances, success would evidently depend much upon the rapidity of shots. That breech-loading small arms *can* be made with an escape of gas at the joint, so slight as not to clog the machinery or cause any appreciable loss of power, many experiments have shown. Among the breech-loaders I have seen in London, Mr. Green's converted Enfield rifle seems to fulfil all the conditions required for a good Government arm.

There is at this moment a board of distinguished officers in session at the Washington Arsenal, in the United States, to examine the

various models submitted to them, in order to determine upon the best method of converting the Springfield rifle—almost identical with the Enfield—into a breech-loader. It is more economical to alter the arms in hand than to adopt new models, and for this important reason some one of the many good methods already devised will be without doubt adopted.

The various means of igniting the cartridge have been much discussed. They all have their advantages and imperfections; but, for army purposes, the balance of opinion would seem to be in favour of keeping the fulminate separate from the cartridge, in order to diminish the liability to accidents. This precaution was regarded of so much consequence, that troops, even in the presence of the enemy, although their muskets were kept constantly loaded, were not allowed to cap until the moment of firing.

Rifled Cannon.—It is not a little singular that while breech-loading small arms have been daily gaining favour, the reverse has been the case with breech-loading cannon. The loss of strength at the point where most strength is required, and the increased expense of the machinery, are serious objections; while the success of the Parrot projectile in accomplishing the same objects with a muzzle-loader —namely, of taking the grooves and preventing windage by the yielding base—has proved the opening of the breech to be entirely unnecessary.

The Regular Army a Nucleus.—In all national insurrections and revolutions in which recourse is had to arms, that party which soonest organises and renders efficient a large army becomes usually the dominant power. Few Governments can afford to keep in time of peace as many troops as would be required for any great exercise of military force. The regular army must therefore be the grand nucleus, and should be at all times so well organized and instructed that the fresh recruits, suddenly added in time of need to give the strength of numbers, can be fitted for the field in the shortest practicable time.

To accomplish this, the profession should be shorn of all useless difficulties, and troops in garrison should be armed and equipped as for service, and exercised and instructed in those duties, only, which make them efficient in the field. It is a serious mistake to have one set of ideas for peace and another for war; and for this reason white belts, burnished barrels, bright chains, and show hats, trappings, perishable embroideries, and ponderous epaulettes, should be abolished. The time given to the rubbing of metals could be much more usefully employed in the gymnasium or the library.

Columns of Fours.—Armies in the field have to be marched over country roads as they find them; and these roads are always narrow, and usually bad. The column of route should therefore be of a width which will allow of easy motion. The column of fours, which is formed by facing infantry in line to either flank, and doubling the files, has therefore come into general use. It has many advantages over the column of company or lesser division, in addition to the facility with which it can pass through defiles only wide enough for four men abreast. Men marching in fours are not harassed with the necessity of pre-

serving alignments; they can pass over the best parts of the roads; they are ready for an attack on either flank, as they are brought into line by a simple face; and by the new movements, which I am now going to explain, they can be more rapidly and easily arranged for action in deployed lines.

FORWARD INTO LINE.—A good illustration of the rapid manner in which a line of battle facing to the front can be formed from the column of fours on the march, is the movement known by us as "Forward into line" (Plate ix, fig. 7). If we suppose a brigade column of fours right in front, and that the line of formation is to be at right angles; at the proper command, the leading company is filed (or, as you would say, wheeled in fours) to the right, and halted and fronted when in position. The other companies of the leading battalion march diagonally to the left from the general column, and each is conducted by its captain to where its left will rest, and then led parallel to the alignment, being halted and fronted when in position. Or, the option is given, under certain circumstances, of leading each company to where its right will rest, and forming to the front on the leading file. The remaining battalions march, by the shortest lines, to their positions, and form on the line, upon reaching it, in the same manner as the first. The edge of a wood or the crest of a hill is more easily followed by troops formed in line, than if the position be approached by the column of companies. We must not forget that lines of battle are seldom straight, and that evolutions are rarely executed on lines at right angles with each other.

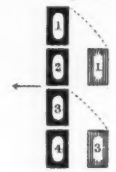
Compare this simple method with that in use with us before the war. The column by company would be first formed. The companies of the leading battalion, after having been wheeled half to the right on the "fixed pivot," would be marched in echelon towards the line of battle: each company, on arriving near its position on the line, being made to execute the half turn. Or, the column might be first closed in mass and then deployed. If there were any woods or ditches in the way, it would be, probably, impossible to execute these movements, as the companies would be unable to preserve their alignments: obstacles ordinarily increase for the remaining battalions of the brigade in proportion as their distance from the front becomes greater. The length of time required for all this complication might expose the men so much to the fire of the enemy, as to make it extremely difficult to form the line even with the best disciplined troops; and if successful at last, it would be with diminished and disheartened ranks. The battalions, during the evolution, have also the disadvantage of being in columns which the enemy's artillery might destroy.

By the flank system, the battalion is extended, and one shot would not be likely to kill more than two men. It is also in position to open fire with every rifle if suddenly arrested.

What then are the objections to this extremely simple "flank system?"

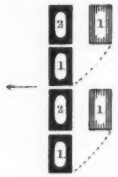
The best American generals agree that there are none; but I have heard it asked, "What would you do if cavalry should charge suddenly?" The answer naturally follows that cavalry cannot charge suddenly; for this supposes a surprise, which is an im-

Fig. 1.



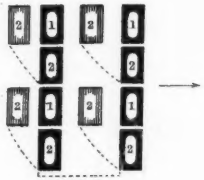
New Method of Forming Fours, Left.

Fig. 2.



Forming Fours, Left.

Fig. 3.



40 inches

Forming Fours, Right.

Fig. 4.

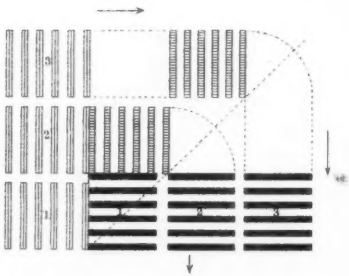


Fig. 6.

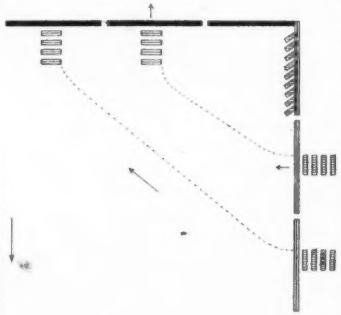


Fig. 5.

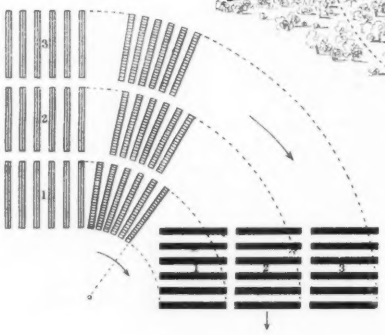
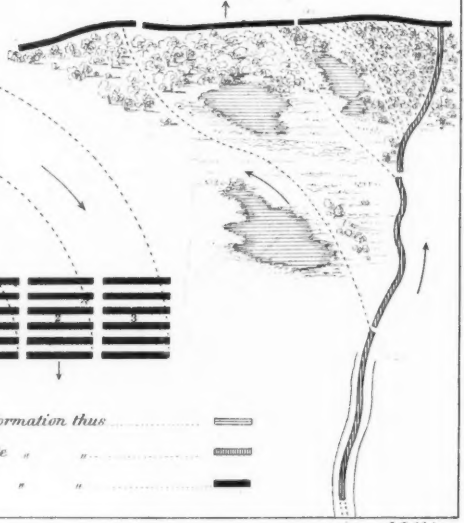


Fig. 7.



Original Formation thus .....

Intermediate " " .....

Final " " .....

J. Jobbins

possibility with the ordinary line of skirmishers on the flanks of the column, and the reconnoitring advance guard; and when we remember that an infantry man occupies about twenty inches in line, and that the formation is in two ranks, giving a fire for every ten inches; and, on the other hand, that in the case of cavalry, the front rank only can fire, while the motions of the horse make the aim inaccurate, that the mark exposed (consisting as it does of the man and horse together) is much larger, while rifles kill at 1,000 yards, and that ground where cavalry can manœuvre must be open, and, therefore, exposed to view, it is scarcely conceivable that cavalry will ever again charge infantry in order. The improbability of such an event is so well established, that cavalry is never taken into consideration by infantry during evolutions, unless in the case of a few detached battalions.

Notwithstanding this, cavalry has become even a more important arm than before. It cuts the enemy's lines of communication, captures his supply trains, destroys his resources, obtains information of his movements and intentions, masks our own grand tactics, and converts a defeat into a route.

Change of Front.—The change of front of a brigade in line will show the difference between the new system, the chief object of which is celerity, and the old, which sacrifices speed to the perpetual precautions against cavalry.

In the flank system, the change of front forward on the right company of the right battalion is executed like the movement forward into line from column of fours, the brigade being simply first faced to the right (Fig. 7). The battalions, other than the right, if the angle be large, march in columns of fours by the shortest lines to their new positions, each being conducted to the point where its right is to rest, and then formed forward into line by breaking the companies from the battalion column, and still marching them by fours until in position.

In the former system it was prescribed that each battalion, except the right, should be formed into a double column by division on the centre (Fig. 6). These excellent marks for the enemy's artillery were then marched to their positions on the new line, and there deployed.

I witnessed the execution of these two evolutions near Culpepper, not long since, by a brigade of five battalions. Each was perfectly executed, and the old and new lines of battle for both were the same. From the first command of execution, to the ordering in of the guides, the time consumed by the cavalry-fearing evolution was twelve minutes; that by the common sense method was *five*.

Discarding Intermediate Movements.—With us an important rule has been established, which we consider should, under no circumstances, be violated—never to employ any unnecessary intermediate movement.

For example, if we have a brigade in a single column by division closed in mass, or, as you term it, "a mass of quarter-distance columns," and we wish to form line of battle, the leading battalion deploys on its first division; the others march in fours, left in front, over diagonal lines, each proceeding to the point where its right will rest, and then marching along the line of battle until in position.

By the Frederick the Great system, the battalions are first marched from the brigade column into echelon, then forward to the line; they then take deploying intervals, and then they are all simultaneously deployed. Until the entire evolution is completed the troops are almost powerless to open fire, besides being liable to destruction by the enemy's artillery while in column, and being unable to march intact, except on the most favourable ground.

Another rule has resulted from the necessity to save time—never to make any movement, or pause in one, that will block a road on which troops are marching, and thus retard the advancing column.

The evolutions of troops in masses have, heretofore, always been very difficult to execute, on account of their complication. I was honoured with invitations to visit Woolwich and Aldershot a few weeks ago, and had the good fortune to see the troops at these stations, and to witness at the latter place, evolutions of the line. I never saw more splendid soldiers, or greater accuracy of alignments, wheels, and details. But as one of the principal objects of this paper is to mention the changes and simplifications in tactics which have resulted from our recent experience in the field, as being applicable to all circumstances of ground and battle, and as these can be best explained by comparison, I may perhaps be allowed to remark that some of the evolutions so admirably executed at Aldershot appeared to me susceptible of simplification, and I thought time might have been saved by avoiding intermediate movements.

Take, for example, the change of front forward on the right battalion, the brigade being in line of contiguous quarter-distance columns (Plate ix, fig. 4). The battalions, except the one on the right, were marched forward into echellon and halted; each battalion was then made to wheel a quarter of a circle to the right, and the outer battalions were marched to their final positions.

The wheel of the quarter-distance column on the right-hand man of the front company as a pivot, impressed me as a movement that must have required a great deal of drilling—I speak, of course, under correction—and that it would be unsafe to hazard with hastily instructed recruits, on account of the liability to mix the ranks. For, while the leading company is required to touch to the right, and dress to the left, during the wheel—our "fixed pivot"—the remainder have to wheel to the right, and at the same time to gain ground to the left. On the other hand, the wheel of a quarter-distance column with a radius equal to twice its width, causing the left guides of companies to follow in the *trace* of the leading one, (instead of covering, as with you), the men to touch, as well as dress, towards the wheeling flank, and the files on the reverse flank to take steps of half a pace, has been found not at all difficult to teach and execute. The battalion changes direction, in fact, like the outer halves of spokes in a wheel.

By the new system, the right battalion is wheeled with a radius equal to twice its front on the "moveable pivot," and the other battalions march over concentric arcs to their positions, without being delayed to execute any intermediate movement (Fig. 5). It is also to

be observed that the arcs are shorter than the sides of the squares that contain them.

We, of course, gain a distance to the front equal to the depth of the column, and each battalion will be the width of its front farther to the left than if the evolution had been executed according to your method. But when we consider that a line of contiguous columns seldom moves, upon the field, except to follow the advance of deployed lines in its front; it is readily seen that the gain to the front is to be desired; and the angle of change being usually quite small, the shifting of the battalions laterally, is scarcely noticeable.

Two Methods of Attack.—There are two general methods of attack with infantry—the one, to commence an engagement as soon as the head of the column reaches the enemy, if he be on the move, without waiting for any extensive arrangements of troops for action; the other, to array a large force in several lines of battle, and advance with concentrated power.

In a rough and extended country the former way is usually the best, as our movements can be concealed, and the enemy is kept so occupied in manœuvring his troops that he is, for a time, deprived of the opportunity of strengthening himself with breastworks.

If the enemy is found holding an important position which cannot be turned, and which it is absolutely necessary to take, the concentrated attack must, of course, be made. For this purpose, three or four lines of battle are formed, from fifty to a hundred and fifty paces apart, according to circumstances. Each line is a battalion, brigade, or division, as the case may require. A line is deployed in reserve, to cover a repulse.

The time selected for the advance of such a column is usually about an hour before sunset. The conflict between the charging forces and those in position is the grandest and most fearful sight of all warfare. I took part in a charge of thirty thousand infantry, in the "Wilderness," which is remembered for its grand manœuvres. There were five lines of battle, some fifty paces apart, drawn up in a valley which made an angle with the enemy's works. The generals of division and brigade, with their staffs, were at the centres of their commands. Generals Meade, Warren, and Sedgwick, occupied advanced positions, where they could watch the enemy and personally direct their own forces. Brigades had been conducted to their places through woods and valleys, in silence, with flags furled and arms trailed; and so admirably were all the details timed and ordered by General Wright, under whose direction the column was formed, that the troops were all in position some fifteen minutes before six o'clock, the time designated for the attack.

It was an anxious quarter of an hour. There were many bright, hopeful, patriotic hearts within a few moments only of death. No one could tell who would escape the concentrated fire of the enemy so soon to be encountered. There was the stillness of the grave among the thousands in those lines.

At last the appointed time arrived, and the division and brigade

head-quarter flags were unfurled. Instantly the regimental colours were given to the breeze; the men, who had been lying on the ground, sprang to their feet, the whole column wheeled to the right, and advanced towards the works of the enemy. It was a test of drill and discipline to execute so grand an evolution under fire; but the veterans of the Army of the Potomac moved as steadily as though only on review.

The well-trained troops of the enemy reserved their fire until the column was within short range, when they opened with deafening volleys. Presently there was a lull—a rush—a cheer—and the earth-works were taken.

To Advance Deployed Lines.—If our infantry be in one or more deployed lines, and not yet under fire, and have to be advanced, it is better to march by the right of companies to the front, than in line of battle, as the movement is freer, and obstacles can be easily avoided by diminishing intervals as required, and resuming them when circumstances permit. A change in the direction of march can also be made with ease, by using a flank company as a pivot, and marching the other companies over concentric arcs.

If a battalion be marching by the right of companies to the front, the easiest way to form line of battle is to file the companies to the right; but, if the line has to continue the advance, and time presses, we may use the movement, "By company into line," or, as you would say, "In double time, front form company." As there is no way of marching men so fatiguing as that of the battalion in line, they should never be so marched unless advancing under fire.

A careful perusal of your "Field Exercise and Evolutions of Infantry" has shown me that the advantages of moving by fours are appreciated in your service, their use being generally authorised. I cannot but think that they will soon with you, as with us, entirely supersede the march by the front, except on occasions of parade.

Forming Fours.—As the formation of fours occurs in nearly every movement, it is important to consider which of the several methods used in different countries is easiest and least liable, under all circumstances, to create confusion.

In order that every man may know his position when his company faces to the flank, the files are "told off" from right to left, as *one* and *two* (Fig. 3), or as *right* and *left*, or in *successive* numbers. In the last case the men have to recollect whether they are *odd* or *even* files; which, although simple enough, is sometimes a little confusing to stupid men.

Our present method of forming fours is objectionable, because the men of a group do not occupy the same positions when they face to the left that they do when facing to the right (Figs. 2 and 3). To explain more fully: if we suppose the men are numbered as *one* and *two* in each rank, and the company is faced to the right, No. *two* places himself on the right of No. *one*; giving us *one two, one two*, from the proper front to rear. But, on facing left, No. *one* is directed to place himself on the left of No. *two*, giving us *two one, two one*, from front to rear. Now, if the company be marching by the right flank, and be faced about, the men

are not in the places prescribed for the face to the left, and have, therefore, either to continue out of place or to make an awkward exchange liable to cause confusion. This difficulty could be avoided by causing No. *one* to place himself on the *right* of No. *two* (Fig. 1) instead of on his left, when the company faces to the left. It may be objected that by this method the line will be twenty inches in advance when the company is again faced to the front; but, when we remember that the object of facing left is to gain ground in that direction, and that the immediate face again to the front would rarely occur except upon the drill-ground, and even then, an exact parallel advance throughout the line of twenty inches, would really amount to nothing; it seems to me this objection—if it can be so regarded—is more than counter-balanced by the advantages of a method for forming fours which will not lead to confusion, and does not require perplexing provisions for "certain cases."

I would also propose to designate the men in the rear rank as *three* and *four*, as their positions in fours would be then thoroughly defined—one, two, three, and four—from the proper front to the rear (Fig. 1).

The ranks should be *forty inches* apart, measuring from the heels of the rear-rank men, to those of the front, in order that there may be ease in marching in line, and that there may be exact room for those men who change position in forming fours. A less distance between the ranks has many objections, and no advantages. The rear rank should be, of course, instructed to close on the front when the line has to fire.

The method used in your service of causing the man who is to change his position, in forming fours left, to step to the left and then to the rear, I like better than ours, as the numbers are not inverted; but, in the field, the new method would, I think, be preferable to either.

General Change of Front.—A general change of front, as made by an army, is so different from the methods perplexingly described and geometrically illustrated by many tactical text-books, that it presents a curious instance of the difference between theory and practice.

If a flank is in danger of being turned—which is usually the reason why a change of front is made—troops from the reserve, or from the other flank, are brought up and placed in position, to extend the line in such direction as best to prevent the enemy from over-lapping it, and to enable us to rapidly add reinforcements.

Flanking and Fighting.—Opposing armies are ordinarily massed on the opposite sides of a stream, as each, when so posted, can best guard against surprise.

An offensive army, which we will designate as A, threatens a railway centre, or some other important point. The enemy will, of course, post a defensive army, B, to oppose it. A makes a feint at one point, and crosses at another; B attacks A as soon as the real advance is discovered, which is usually before the crossing is completed. A extends his flank, say to the left; B extends his right. A takes troops from his right, and with them extends his flank still farther. B changes troops from his left to his right. Thus we have "fighting and

flanking;" A, if successful, continually getting nearer to his objective point. Many changes of position are made during the night; and it is evident that much depends upon rapid marching and manœuvring. The facility with which breastworks can be constructed in a wooded country, and their advantage to the army attacked, is another reason for this constant motion, as it is highly important to strike the enemy before he has time to throw up a protection, which—if the ground be favourable—can be made of sufficient strength in an hour or two to be of important service. There are many generals of eminence in Europe, who disapprove of these light breastworks, and argue that they prevent manœuvring, and that men covered by them cannot be made to leave the lines for a forward movement. Experience has shown that manœuvres under fire are almost never required, the troops in position having merely to remain there until they weaken by their fire the advancing line, which, if staggered, should be at once charged with the bayonet. If they cannot hold the line, of course they break to the rear. To provide for this, a second line is arranged in the same manner, and the men are made to lie down. The moment the fugitives have run over them, the second line should rise and open fire upon the pursuers. More lines should be in position in rear, if there be troops enough to spare for that purpose. Three lines are ordinarily enough, and in some cases a single line may be sufficient, if the works are well made. I remember an instance in the "Wilderness" when General Wright's sixth corps was satisfied to rely upon a single line.

During the more recent campaigns, breastworks were thrown up at almost every general halt; these were found of such important service, that they have become a part of the general system in the management of an army. They gave such strength to positions that no general would attack troops behind works, even though slight, if there were any way in which they could be turned. Sherman's march to Atlanta, and Meade's to the James River, were conducted on these principles.

A remarkable example of the strength given to a position by the judicious use of the spade and axe was the battle of Franklin. Hood's determination to destroy Schofield before he could reach Nashville, led to the terrible slaughter at that place. And, although Hood's army threw itself upon Schofield's with a bravery and a devotion to their cause and leader which excited the highest admiration of our men, even amid the excitement and perils of that fierce struggle, yet his killed and wounded were piled up in front of the works in such vast numbers that his army was virtually destroyed in the attempt to break lines strengthened by intrenchments.

The general principles of flanking and fighting apply as well to an open as to a wooded country, for the undulations afford crests for lines of battle—which, in the field, are never straight—and valleys for manœuvres.

Minor Tactics.—But little can be accomplished towards a general result by a single battalion, or even a brigade; for large numbers, acting with the power of concentration, can alone produce decisive effects. The minor tactics taught battalions and brigades should therefore be those they would have to use when taking part in the manœuvres of

large bodies of troops, with such additions as will enable them to take care of themselves when isolated. Evolutions should be executed habitually in quick time; and the double-quick used only in cases of emergency, in order not to waste the strength of the men. Except for the drill of the recruit, slow time should be for ever abolished.

SHARPSHOOTERS VERSUS ARTILLERY.—The inexperienced suppose that sharpshooters can be effectually employed to pick off gunners. They can, of course, at times greatly annoy artillery, but they cannot be relied upon to silence batteries, for they are, in turn, exposed to the sharpshooters of the enemy. If we support them by infantry in line, the enemy will do the same, and in this way a general engagement may be brought on, when and where we least desire it.

INFANTRY, CAVALRY, AND ARTILLERY.—It is established as a general rule, that infantry fights infantry, cavalry fights cavalry, and artillery fights artillery.

A battery being opened, two are opposed to silence it. This either causes its removal or its reinforcement by more guns: which leads to the artillery duel.

The raids of cavalry having become important aids to the success of infantry, the enemy will always endeavour to prevent them; which he can only do with superior cavalry. This leads to large columns and cavalry engagements.

Artillery is sometimes massed against infantry with great effect. When it is certain that the enemy is forming the concentrated column of attack, artillery should be placed to oppose its advance. Antietam, Gettysburgh, and the Wilderness furnish instances where this was done with success.

I would very gladly pursue these details, did time permit, in order more clearly to indicate the difference between our old and new methods of manœuvring infantry in the field: but I will confine myself to briefly stating a few general principles at which we have arrived.

GENERAL RULES.—Infantry should be marched always in fours.

When in presence of the enemy lines should be deployed.

When battalions are moved from one position to another, they should be conducted by the shortest lines, and in such formations as will enable them to open fire with the least delay and greatest development.

In the execution of an evolution, no battalion should wait for another, and no brigade should wait for another; unless a simultaneous movement is absolutely required to avoid leaving a gap, of which the enemy might take advantage. Successive formations are almost invariably the best.

Lines in action should not hazard any manœuvre that can be avoided, as the attempt might prove fatal. One line advancing to relieve another should run over it, the men to be replaced throwing themselves upon the ground for the purpose, at the instant they are reached by the fresh troops. A line deployed to relieve a line driven in, should lie down until run over by their own men.

A provost-guard should be deployed behind each line of battle to shoot down the cowards who turn from the front.

Troops in reserve should be massed as compactly as possible, in order that they may be most available for an emergency in any direction.

In a column of route, battalions should march right in front if the enemy be on the left; left in front, if the enemy be on the right.

On the route, the column nearest the enemy should throw out, on the side exposed, about one-tenth of its number as flankers.

Troops should be thoroughly instructed in the few movements necessary for the field, and there are but few; and should *not* be made to waste time in acquiring evolutions of no practical use, and which are heavy burdens upon the memory.

Commanding officers should regard tactics as teaching general principles and movements; and should not hesitate, in cases of emergency, to make such combinations as will best ensure the success of an attack, or of defence.

Simplicity, *celerity*, and *the least fatigue to the men*, are the three grand elements of efficiency and success.

NEW TEXT-BOOK.—There being no text-book which taught these new flank manœuvres as executed in the field, and appreciating the force of the maxim that "success is the measure of merit," I prepared for my own use, chiefly, a small volume containing those movements used by the battalion and brigade. It was received by troops in the field with so much favour, on account of its establishing a system of drill at once simple and uniform, that I was induced by my military friends to make the work complete by adding instructions for recruit, company, and skirmishing drill. That my labours would find favour in my own country I did not doubt; but I was scarcely prepared for the gratifying notice that has been taken of my book by an influential portion of the English press, or for the cordiality with which officers of every branch of your service have received the suggestions I ventured to lay before them. Believe me, I esteem myself fortunate in having been permitted to explain my views before an audience such as the present, in the theatre of this distinguished Institution, which has already done so much for the advancement of military science.

The CHAIRMAN: I am sure I shall very much weaken our admiration of the lecture which we have just heard, which has been so clear, so lucid, and so intelligent, if I were to say a single word more than to move that we return our best thanks to General Morris.

Evening Meeting.

Wednesday, May 2nd, 1866.

CAPTAIN E. GARDINER FISHBOURNE, R.N., C.B., in the Chair.

ON THE LOSS OF LIFE AT SEA.

By WILLIAM STIRLING LACON, ESQ.

IN a paper which was read at the Society of Arts last February, by an *officer of the Board of Trade*, he states:—"That while much "good may be done by statutory regulations for mutual convenience, "such as for ships meeting and passing on the high seas, surely no "permanent good can be effected by statutory restrictions in points of "detail for governing the concerns of trade, and of daily life; for "example, by restrictions respecting the building of factories and "workshops, or the building, equipping, and navigating of ships; and "whilst, on the one hand, it may be admitted that there are many cases "in which it may be not only expedient, but proper, that Government "should interfere, there can be no question that Government inter-"ference is not only unnecessary, but may really become vicious, if it "attempt to attain an end by official inspection and supervision, that "can be better attained by the development of free and healthy com-"petition, and by the self-interest and emulation of the trader, since it "fetters the development of trade, it stands in the way of the ad-"vancement of science, and it interferes to the prejudice of the "liberty of the subject." And at the conclusion of his paper, he says, "The question ought not to be—Is such a department right in "requiring this, or wrong in requiring that? but, Is our Legislature "right in requiring this, or wrong in requiring that?"

Sir John Pakington in his speech in the House of Commons on the loss of the "London," stated—"The subject involves to a great ex

"tent the welfare and safety of a large portion of Her Majesty's "subjects," and further on he expresses himself—"whether this "dreadful occurrence does not force upon us the question, whether "the present state of our law for the protection of that portion of the "public who are compelled by their business to pass to and fro be- "tween the Colonies and the mother country, does not require amend- "ment." "We cannot," said the Right Honourable Baronet, "recall "to life the unhappy persons who were drowned, but we must, if we "can, guard the public for the future, and looking at the matter from "that point of view, I must say that the investigation was utterly "futile for any purpose of discovering what were the real causes of "the unfortunate calamity to which I am referring. I again state, "broadly and distinctly, as my opinion, that with the sort of report "which I have now lying before me, instead of the result of the in- "quiry filling my mind with the conviction that all was right, it has "filled it with the conviction that all was wrong."

And the *Times*, in a leading article on the loss of the "Queen Victoria," says, "Our seamen will unhappily do everything with danger, "but provide against it. They will dare it, they will vanquish it, but "they will not encumber themselves in time of apparent security with "preparations against hazards unseen. We discharge at any rate our "duty, by bringing the subject once more for the twentieth time be- "fore the public eye, but the inveteracy of seamen in this respect is "so supported by the natural heedlessness of Anglo-Saxon voyagers, "that we cannot look with any confidence to the effects of even this "fearful warning."

It has been stated publicly that the annual loss of life by shipwreck n this country is *two thousand.*

With such hecatombs of human life, who can calculate the bleeding hearts, caused by so many friends and relations being plunged thus suddenly into eternity, and when "*a voice from the dead*" will not rouse the country from its indifference, does it not behove any one who thinks he has something to say, to come forward fearlessly and say it, and this I purpose now to do, with the deepest sense of the responsibility I incur, taking care, however, not to say anything which might be construed into an expression of opinion.

It will be for you to determine whether the dangers of the sea——the carrying boats nailed to the ship——not slackening speed in a snow storm when close to and running in towards the land——worthless boilers——cheap anchors and cables——employing uneducated, inexperienced and cheap captains——uneducated and cheap mates——being undermanned,——crews utterly undisciplined——going in a dark night at full speed across a much-frequented roadstead and tideway——not slackening speed in a fog when close to and running in for the land——not carrying lights——starting with an ill-constructed and overloaded ship with a drunken and undisciplined crew in boisterous weather——sitting on the safety valves——not

heaving the lead——&c., &c.——acts which are so impiously termed the acts of God, are not rather to be attributed to the *recklessness* of man.

In the paper alluded to at the Society of Arts, the various questions were gone into of "bulkheads," "boats of sea-going ships," "safety valves," "compasses," and "anchors and cables," but I purpose to confine myself, as regards the *equipment*, to the simple matter of "boats," and not to go into any detail even as regards them, but simply to use them in illustration of a *principle*, and with regard to "ships," to speak only of *three*, and that only in illustration of my argument, namely,

The "**Orion,**"	lost on the coast of	**Scotland,**
The "**Queen Victoria,**"	lost on the coast of	**Ireland,**
	and	
The "**London,**"	lost if not upon the coast, shortly after having left the coast of	**England.**

The 1st with a loss of nearly 100 lives,
The 2nd with a loss of 59 lives, and
The 3rd with a loss of upwards of 200 lives.

In June, 1850, the "Orion," a fine steamer left Liverpool for Glasgow. "About a quarter past one in the morning she struck upon "some rocks quite close to the Portpatrick light-house, filled instantly, "and sunk in a few minutes. The rock upon which she struck does "not appear to be more than 150 yards from the shore. The night "was clear and calm, a slight haze was creeping over the land. The "light-house of Portpatrick loomed over the vessel as she struck, and "almost irradiated the last struggles of the victims, as they were "sucked down by the whirl of the water when the 'Orion' went "down. The boats were so fastened and placed that they were not "available for immediate use. One of the life-boats, says a passen-"ger, was so firmly fixed in her supports, that they had to be knocked "away by the carpenter with an axe or forehammer. All the boats "were launched with great difficulty. The circumstances were partly "witnessed from the shore, and the alarm being speedily given, every "available boat in the port was soon at the wreck."

In February, 1853, the "Queen Victoria" left Liverpool for Dublin. "The wind was not unfavourable, the weather remarkably fine and "the run was nearly completed by the sight of the Dublin Bay lights, "when snow began to fall heavily. Suddenly and without previous "warning, the mate called out to stop the ship, but it was too late, "and in another minute she was ashore. The vessel had struck bow

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" on just above the Bailey Light, at the northern extremity of the Bay. " After the vessel had struck the snow storm had passed away, and " the morning was fine and the water smooth."

In December, 1865, the "London" left Gravesend for Plymouth, and on the 6th of January she steamed out of Plymouth Sound, and in the Bay of Biscay she encountered the weather and met with her untimely fate in a manner, the particulars of which are too recent and too well known to require any repetition.

After the loss of the "Orion," the Report of the Board of Trade, dated *August 8th*, 1850, states:—

" The boats of all passenger ships should occasionally be inspected " by a Custom House Officer or Board of Trade Surveyor, in order to " insure the number and size of them as prescribed by law, and that " they be in good condition, properly equipped, and easily lowered to " the water, and that the master has stationed the mates and crew to " the best advantage among his boats for their separate constant care, " and efficient service on emergency; each boat to have a distin- " guishing number painted on her bows; and that the master be " required to see that his boats are uncovered, and their gear in place, " and all clear for immediate use, at sunset, when out of harbour."

In February, 1853, the *Times*, in a leading article, says: " As the " 'Queen Victoria' was lying in the Liverpool docks *last July*, a " gentleman, competent to observe such matters" (and when I mention that he is a member of the Council of this Institution, I think it will entitle him to a favourable consideration at your hands) "noticed that her boats were indeed sound and " spacious, but that they were enveloped in strong canvas, " painted black, and actually laced below the bottom of the " boat, while the machinery for lowering them was so defective " as to be virtually unserviceable. So absolute indeed was the " default of any proper precautions against sudden accident, " that the observer called one of the seamen to him, and pointed " out the circumstances, and remarked that the day might come " when this inattention to apparently small particulars might " cost many lives. That day did come, and the lives have been " sacrificed accordingly."

After the loss of the "Queen Victoria," the report of the Board of Trade, dated 18*th February*, 1853, states:—

"There was an extra life-boat; the two quarter boats would hold twenty " persons each, and the two life-boats would hold double that number, " but unfortunately these boats, instead of being suspended over the

"side, were placed upon chocks on board, and it was necessary to raise "them about three feet, and reverse the davits before they could be "lowered into the water. After the vessel struck, the captain's presence "of mind appears to have entirely deserted him. The snow storm was "passed over. The morning was fine, and the water smooth. The "boats might easily have been prepared, and the lives of the people "saved; but no directions were given. The two life-boats, which ought "to have saved so many, appear to have gone down with the vessel. "The result is that the lives of *fifty-nine persons*, including the unfor- "tunate master, have been sacrificed for the want of proper care and "attention. With regard to the boats, I deem it my duty to state my "opinion, founded on the present and former cases of accident, and to "suggest that it would be very desirable if, in all cases, the boats "were placed, &c., &c., &c."

After the loss of the "London," the Report of the Board of Trade, dated *5th March*, 1866, states:—

"That application was made by counsel, on behalf of the friends of a "passenger who was lost in the ship, for permission to cross-examine "the witnesses produced by the counsel managing the case by appoint- "ment of the Board of Trade, but the permission could not be "granted, the Act of Parliament not having given that power."

Having now brought you from the "Orion," through the "Queen Victoria," to the "London," and shown you the action of the Board of Trade, I will now take you from the "London," through the "Queen Victoria," to the "Orion," and show you the operation of the law.

In the case of the "London," *no body was found; there was no corpus delicti*, and an inquiry was ordered according to Act of Parliament by the Board of Trade, which Sir John Pakington characterized in the House of Commons as a "mockery and a delusion."

In the case of the "Queen Victoria" four bodies only were found, the rest having been carried out to sea by the tide. *Only one body was identified.* A coroner's inquest returned a verdict of "Culpable negligence" against the captain and mate, but the captain having been drowned, the mate was committed to take his trial for "manslaughter." He was bailed, but he was not tried, as the grand jury threw out the bill.

In the case of the "Orion" numerous bodies were washed ashore. The Procurator Fiscal was soon upon the spot, and the captain and

two mates were indicted before the High Court of Justiciary in Edinburgh for "Culpable homicide," the first mate afterwards having been acquitted.

Before the LORD JUSTICE CLERK (HOPE), LORD WOOD, and LORD IVORY.

I never left the Court for one moment during the trial, which lasted three days, and I may mention that it is now fifteen years ago, and about six months after the trial, I met his Lordship in a railway carriage, and although I felt the impropriety of addressing a stranger on such a subject, I could not help saying to him that I believed his words upon that trial would hereafter prove a blessing to the country. His Lordship is since dead; Lord Wood is dead; and Lord Ivory has, for some time past, retired from the bench. Three times have I been and taken down the musty volume from its shelf, in order to make extracts from "The charge to the jury," but I have decided to read it *in extenso*, that not one syllable should be lost in the present state of the question in this country. I can only regret that it has not fallen to more worthy lips than mine to give them utterance.

> "Culpable Homicide—Culpable Neglect of Duty and Loss of Life. Held 1st, that these were substantially one charge whenever an accident happened which occasioned loss of life; 2nd, direction to jury that when the Crown had proved an accident by loss of life in a vessel under panel's command, it lay on them to prove their innocence of all blame."

The Lord Justice Clerk, in charging the jury, observed "that, as had been remarked in many cases, there really was no difference between the crime of culpable homicide and culpable and reckless neglect of duty, which resulted in the loss of life, and the jury must, therefore, under their charge, consider the case as one of culpable homicide. Intention to do wrong was not part of the crime of culpable homicide; if intention was proved under such a charge, it would amount to murder. The crime of culpable homicide was committed whenever a person unintentionally committed an act whereby the life of another was lost, or where he failed to perform his duty, when charged with the preservation of life, without having a sufficient excuse for such neglect, and life was lost in consequence; and it was the wish of the Court to express this the more strongly, as they were of opinion that the introduction of two charges, amounting in law to the same offence, under circumstances such as those which had been proved in the course of this investigation, was inexpedient, as tending to distract and confuse the minds of the jury."

"The principles of law, the Court was bound to lay down to the jury, had been much considered in recent cases, particularly that of Paton and McNab, November, 1845, Brown, vol. ii, p. 515, and it consisted in

this: "That any person placed in a situation in which his acts may "affect the safety of others must take all precautions to guard against "the risk to them arising from what he is doing." That would also be the principle adopted and enforced by the court in the cases referred to by the counsel for the panel Henderson, though, no doubt, exceptional expressions might be found in almost every case, occasioned by the peculiarity of the facts proved at the trial. The jury must take into consideration the whole indictment, as forming one substantive charge: and on the proof which had been adduced they would consider whether it was sufficient to establish the charge which had been preferred against the panels respectively.

It was unnecessary that the panels should be guilty, to the same extent, of culpable neglect of duty which occasioned loss of life. There might be innumerable degrees of guilt under such a charge, occasioned not merely by the amount of recklessness displayed, but by the duty and responsibility which the party had undertaken. The principle however being, as before stated, that a party charged with care of life was bound to exercise to the utmost extent all the caution and care within his power, such an occurrence as that before the jury, where a vessel was shown to have been sailing for a long distance unusually near shore, and at length, immediately after seeing Portpatrick Harbour Light, continuing the same course, until the vessel was struck on a well-known rock, on a calm and comparatively a clear night, threw on those on whom her management depended the *onus* of showing respectively that they had done everything within their power to prevent the occurrence of such a catastrophe. No doubt the guilt might arise from totally different circumstances; that of the captain, from improperly leaving his vessel in charge of the second mate; whilst that of the mate might arise from the manner in which he exercised the trust reposed in him; but though the circumstances which tended to establish the charge might be totally different, that would not affect the question, as to whether both could be convicted under the indictment.

It was not a relevant defence for the captain to say, that the mate had navigated the vessel in a more careless and reckless manner than usual, if he, the captain, was not justified in committing her to the care of the mate at all. On the other hand, it would be equally no defence to the mate to say, that the captain having improperly committed the vessel to his care, he had so completely neglected the charge he had undertaken, as after repeated warnings, to run on shore by a course of reckless navigation, whereby the vessel was wrecked and large loss of life was occasioned. The jury would consider the facts under reference to the libel, and see whether or no there was charged against the panels neglect of duty of that species which has been proved as affecting each, as it would not do to convict them on belief that there was some other duty, not charged in the libel, which had been neglected by either or both of them, the observance of which might have averted the catastrophe.

The duty of the party entrusted with the care of life must necessarily vary according to circumstances, and the capability of ordinary

endurance for its discharge; thus it would not be contended that a person in command of a ship sailing to a distant port, through open seas, was bound to exercise, or could by possibility exercise, the same amount of endurance and watchfulness in the management of the vessel, which the captain on a short course, and especially on a coasting voyage, would be bound to exercise, any more than it would be contended that there was no difference in the amount of watchfulness required by the captain in a vessel at sea, whether the weather was calm or tempestuous.

The responsibility of each voyage was much affected by the character of the voyage itself, the weather in which it was performed, and the ordinary physical capacity of a healthy man to perform the duties he undertook to discharge. It was a common remark, that persons circumstanced as Captain Henderson was, would be sure to take every known precaution to avert danger from himself, and it had been strongly urged by his counsel that he had done nothing on the occasion of the accident different from what was done according to the practice of all captains on that navigation. If, however, the jury were of opinion that there was culpable neglect of duty in what he did, that it was not necessary to retire to rest at the period in question, and that there was culpable neglect of duty in leaving his post, it was no answer in law for him to say, that others had been in the practice of committing the like wrong. Nothing could be more mischievous than such a doctrine, as it was the occasion of almost all like accidents. Men became accustomed to perils, and daily became more and more daring and rash in the exercise of their avocations; and it was surely no answer, when at length the danger which had been so often run, resulted in the death of some fifty beings, to urge that hundreds daily before had been in danger by a course of like reckless conduct. It was much to be feared that captains often ran close to the shore to avoid currents and tides in order to save time; and having escaped disasters on repeated occasions by such courses, they became overconfident, and at length adopt a course which at first they would have thought it insane to attempt. That was the great occasion of accidents of all kinds; but the leading principle to be adopted in judging of such cases, was not how near the coast a captain might venture without danger, but how far off he ought to keep in order to avoid all risk whatsoever; and, as before mentioned, it was incumbent on the captain to show that he had not authorized a course to be followed, within which there was any risk, as also, that he had not improperly delegated his charge to the mate, before, in law, the jury would be entitled to acquit him of blame for the accident which had occurred.

It was in evidence that there was no division of labour or trust by the employers, between the captain and the mate, and, more especially, there was none between captain and second mate. There was thus a delegation of duty by the captain to an inferior officer which, if unwarranted in itself, could not be justified by any instructions in the service. This took place on a voyage, which on ordinary occasions, did not exceed fifteen hours, and which on the occasion in question commenced at Liverpool at four o'clock in the afternoon of a beautiful

summer day, when the vessel was steered down the Mersey by the river pilot, thus for that portion of the voyage lessening the captain's responsibility. Could it be said then, that the captain was not bound to have started fresh from Liverpool, so as to have enabled him to remain on watch during so short and easy a voyage. It was quite different, as before stated, from the case of captains out at sea. It was not pretended that the captain's duties required him to superintend the loading of the vessel, and this still further left him without excuse on the score of physical inability to maintain the watch throughout the night.

It had been urged that the course kept by the "Orion" from the Mull of Galloway northwards, on the night of the accident, was pretty much the same as that observed usually by steamers trading between Liverpool and Glasgow. No doubt companies were anxious to make quick voyages for the sake of profit, and captains were anxious to please their employers by performing the passage as quickly as possible. The evidence as to this was somewhat contradictory (which his Lordship read), but the fair import of the whole appeared to be, that they were much nearer the coast during the whole course than usual.

If the jury thought such was the case, it bore upon the captain in two ways; first, in respect of having sanctioned a course so near the shore, as he was shown to have been on deck long after passing the Mull of Galloway. And, second, in having committed, under such circumstances, the charge of the vessel to another. It had been said, that there was nothing more than error in judgment attributable to him. That he did err in judgment, as before mentioned, was undoubted, had his conduct been intentional to produce the disaster which occurred, his crime would have been that of murder. The question was, did he, charged with the care of a vessel containing so many passengers, culpably leave her to the care of another, by whose mismanagement the wreck was occasioned.

Honesty of intention, and anxiety to serve the interests of his employers, did not form a justification even for directing or sanctioning a course so near in shore. His primary duty, and one which no commands from the Company could absolve him from, although it might render them guilty in respect of having issued them, in case of their directing so unsafe a passage, was to preserve the lives of the passengers who sailed in the ship, and on the whole matter the jury would have to say as regarded the captain, whether or not he had been guilty of the culpable and reckless neglect of duty charged, either by directing or sanctioning an unsafe course, or by having unnecessarily and culpably delegated his duty to the mate.

As before mentioned, the Crown having proved the accident to have occurred under his command, it fell on him to prove that he was entirely innocent in both respects. If the jury thought he was culpable in *any* degree in respect of the matters charged in the indictment, they were bound to find him guilty, leaving the question of punishment for the determination of the Court, who would consider the amount of guilt.

As regarded the case of the mate, the case that had been prin-

cipally made for him as to the deflection of the binnacle compass, entirely failed. It was proved beyond doubt that the land was visible the whole way from the Mull of Galloway northwards. It was in vain then to talk of a deflection of the compass on a coast so well known as Wigtonshire, and the jury would consider whether or not it was consistent with innocence that he did not keep further out at sea, when the land within sight was a rocky shore, more especially after receiving warnings from the seamen who were on watch, and who admonished him of the fact, and more especially after passing so close to Portpatrick Harbour, the light of which was seen and recognised. Had he called the captain when he perceived himself so near the shore, and had the latter sanctioned the course which the mate was then following, the mate might have been as much relieved as the steersman, who obeyed his (Williams') orders. Nothing of the kind, however, was shown to have been done by him, and the jury would say, having regard to the doctrines of law laid down in the case of the captain, whether the mate could be entirely innocent of the neglect of duty charged, so as to enable them to acquit him.

His Lordship also remarked, in reference to the case of the boats, that although the Court thought that there was not enough to warrant the jury in convicting in respect of neglect of duty as to them, yet the facts proved, and the lamentable results which had happened from the state in which the boats were at the time of the accident, and their original construction was most important, as showing the consequences of inefficient boats in case of accidents. Should it be found on any future occasion that life was lost in consequence of inability to launch or navigate the boats, arising from such impediments as the coverings which had been spoken to in this case, or any other device resorted to for the purposes of economy, either of the boats themselves or the vessel to which they belonged, grave criminal responsibility would arise, as well to the captain, who neglected to use all appliances in his power to keep them in proper order, or to the proprietor who should fail to have supplied sufficient boats in the first instance, or refused proper allowance to have them maintained."

Is it not like "*another voice from the dead ! ! !*"

"The jury, by a majority, found the captain guilty of culpable but not reckless neglect of duty, and unanimously found the panel Williams (the second mate) guilty of culpable and reckless neglect of duty, as libelled."

Lord Wood remarked: "The 'Orion' left Liverpool on the 17th of the month of June, a fine vessel, one of the finest in the trade, a vessel fully equipped for the voyage, having on board at the time a valuable cargo, and no less than 200 people, consisting of crew and passengers, and she was a vessel with a steam engine of great power, and capable of being propelled at the rate of 14 or 15 knots an hour. When such a vessel, with such a cargo, and with so many persons on board, left the port of Liverpool, it appears to me that every man who had any charge in the navigation of her should have left it with the

thought indelibly impressed on his mind that no vigilance, no care, and no anxiety, which he could bestow in the navigating of the vessel to her port of destination should be awanting.

Your Lordship emphatically stated that it was the paramount duty of every one navigating such vessels to consider first the safety of the ship and passengers. The contrary course appears to have been followed here. The captain chose a coasting course, apparently trying what peril the vessel could be put into, and yet bring her to her port of destination, instead of his thinking only how he could carry her there in safety. And carried she might have been, for it was a clear course—a known course, it was an accustomed voyage, and she was under the charge of those who knew every part of the voyage. Now, my lords, in these circumstances, the jury has found, by a majority, Henderson, the master, guilty of culpable neglect of duty as libelled, and they have unanimously found Williams guilty as libelled. The prisoner John Williams has been found guilty of culpable and reckless neglect of duty in navigating this vessel, by which neglect the vessel was wrecked, and that melancholy loss of life charged in the indictment, occasioned. I am sorry to say that I feel it impossible, with such a verdict, in such a case, to propose any other sentence than one of seven years' transportation. Any other sentence would be an inadequate one, and would neither satisfy the law, nor the great interests at stake. But we are enabled, and I am most happy by the verdict, to make a distinction in the amount of punishment between the mate, Williams, and the master, Henderson, because the jury in his case have found him only guilty of culpable neglect of duty, and not of reckless, as well as culpable, neglect of duty, and certainly it is a very material difference in the verdict with regard to him. If the verdict had included in it recklessness on his part, of course there could have been no other sentence than one of transportation; but I feel, as every one must feel, that in dealing with the case of a person such as the master of this vessel, no sentence which the law could pronounce would make any impression, unless it was one that would bear severely on him. In these circumstances, making every allowance for the distinction which the verdict admits of in the case of the parties, and by every consideration which I have been able to bring to mind, and I have every desire to make such a distinction in the case as is consistent with the ends of justice, I have, after much consideration, come to the conclusion that the sentence may be mitigated to one of imprisonment, although it must be one of time, and such a sentence, as those in charge of such vessels must feel that, for the very slightest neglect of duty, which is followed by such disastrous results as occurred in this case, and even far less, they must answer to the law. I, therefore, propose a sentence of imprisonment for eighteen calendar months."

Lord Ivory and the Lord Justice Clerk concurred.

Would that I could let you away with such golden words ringing in your ears, but I must finish as I began, with extracts from the paper of the Board of Trade:—

"In 1853. The 'Times,' of Glasgow, blew up off Dublin, scalding "33 people, and absolutely killing 12. She had recently been surveyed "by the Board of Trade surveyors, and she had a Board of Trade cer- "tificate. The boiler of the 'Times' had been patched. The surveyor "was not aware of this; he never saw it. It is true that, as a surveyor, "he ought to have found it out; as a detective he was at fault. "But it is also true that this lamentable loss of life might have been "prevented if the chief engineer of the vessel, a servant of the owners, "who did know of it, and who actually accompanied the surveyor to "the boiler, had called the surveyor's special attention to it, instead "of leaving him to give his certificate on the supposition that the "boiler was sound, and in utter ignorance of the patch. The "penalty ought rather to attach to the owners and their servants, "who must be aware of all defects, than to the surveyors, who may "sometimes be misled by *suppressio veri*. If a sore place or a defective "rivet in a plate of an iron hull, or a crack in a stern post, or a weak "place in a boiler, can be concealed cunningly for the surveyors to "give their declarations without first putting the owner to the ex- "pense of repairs, the owners are all the better off; but the insurers "and passengers, through no fault of their own, are the sufferers, and "the public misled.

"The coroner's jury brought in a verdict of manslaughter against "the Board of Trade (the surveyor)!!

"And in the case of the 'Tonning,' the Coroner, in summing "up said, the owners of the vessel would not be criminally liable "unless they absolutely knew the fact that the boilers would not "bear a due pressure; and they could not be liable moreover, "because at the very time the accident occurred the vessel was "running with a proper certificate from the Board of Trade. By "no possibility, however, could the slightest blame attach to the "owners. The boiler of the 'Tonning' exploded off Lowestoft, in "1860; five men and three boys disappeared altogether at the time of "the explosion, and were never heard of afterwards. Five people "were landed from smacks, dead or dying, and five badly scalded, and "out of thirty, the whole number of persons on board, seventeen only "escaped alive, and out of these twelve only were uninjured."

As an incident in connection with the fearful shipwreck of the "Orion," which was much talked of in Edinburgh at the time, I may mention that Captain Macneil, the brother of the Lord Justice General, in the spring, visited the island of Gigha, lying almost off the coast of Wigtonshire. Here was an old family burial-ground, which he ordered to be restored, and four blank tablets to be erected for future use. He went to England with his family and returned with them to Scotland in this ill-fated ship. Three bodies, that of himself, his wife, and one daughter, were washed up upon the shore. Another daughter —a pretty interesting girl, reached the shore alive; she spoke, but died immediately afterwards.

MR. CHAIRMAN.—It has been said by one or two to whom I have read this paper, that having raised the *question* I have no right to leave it without stating my opinion, without suggesting a "remedy."

I should have thought that the whole paper is suggestive enough, but I wished not to weaken the force of what I have been the humble instrument of conveying to you, by any language or opinions of my own.

As a *private individual*, however, I will not shrink from the expression of my opinion, and even suggesting a "remedy," because, although it will go forth to the public in connection with the paper, it will still only be the opinion of a *private individual*, and command no more attention than it is worth. It is this—

That in all cases, there should be *one registered* proprietor or managing owner,——"that in the loss of life at sea," evidence of the death should supply the place of the *corpus delicti*,——and that some efficient machinery should be established, whereby the common law of the land should really and truly be brought into operation, for offenders, in the words of the Scotch Judges (as quoted in the paper)—

"Must answer to the law."

An Underwriter at Lloyd's writes to me since the preparation of the paper—

"I wish you could persuade shipowners to find and man their ships "properly, and that would in some measure, at least, diminish the great "loss of life that annually takes place, and also the transfer of much "money out of our pockets."

The CHAIRMAN: You will perhaps allow me to make a few remarks at the commencement, though it is contrary to what is our usual custom, with the view to get a discussion upon this very valuable paper. The heart of the country having been profoundly stirred by the sad catastrophe of the "London," it has occurred to me that some gentlemen, having feelings still strong upon the subject, would enter upon the details; and any discussion of the unsatisfactory evidence obtained by that inquiry, much of which was very conflicting, would be profitless, and utterly foreign to the object of this paper, which is rather to provide a remedy. It will be for you to discuss, whether the remedy proposed is efficient; and, if not, in your opinion, to state a remedy that you think would be efficient. The paper has given you specimens of the operations of English law; and it has given you a specimen of the operation of Scotch law,—I might say of Irish law, because the verdict of the coroner's inquest was rather an Irish one. But I think we may say what the law is, and what the law may be; and I dare say some will even say, what the law ought to be; and that is, holding the owner and captain, and men, severally responsible, in the degree that they ought to be, to the law. Mr. Stirling Lacon has given you a long extract from the judgment of the Scotch Court. It may appear to some to be too long, but to me it appeared quite the reverse. It was pregnant with great and valuable suggestions; and it cannot be too extensively circulated, for until responsibility is fixed on the right persons, we shall remain just in the same sad state that we are in now. We are continually startled by the records of these sad and deplorable shipwrecks and loss of life. The points to be discussed had better be confined to the paper, instead of going off upon irrevelant matter; and these points

are the three mentioned in Mr. Lacon's remedy. First, that there should be one responsible person, who could be brought to the front and held responsible, and his servants, through him, according to their several degrees. Next, that in case of shipwreck and loss of life, evidence of death should be taken in lieu of the *corpus delicti*, so as to make the law more effective and more easily brought home. And, lastly, the most important point, to be gathered from that Scotch law, is the appointment of a public prosecutor, an officer unknown in England according to our law, but seeming to be a necessary one, to deal with these cases, by bringing persons before the judicial courts of the country. I think the meeting will agree with me, that it is desirable to keep to these three points, extending them only so far as is necessary to get an effective remedy. We shall be glad to hear any gentleman that has any remarks to make upon the paper.

Rear-Admiral HALSTED: I may rise to say, that I think our profession, especially, as represented in this Institution, has done itself honour by the mooting of this question; and that we are greatly obliged to Mr. Lacon (a Member of the Council), for bringing it forward. As for questions of law there is no doubt whatever that they must be determined by those who are educated therein, by, if necessary, a sea lawyer, which I am not. What we have done is, through the medium of this paper and the exceedingly simple and effective way in which it has been prepared, to put before the whole of our brethren, north, south, east, and west, the facts of the case. The mind of England has been stirred by this late event, almost as much as if such events were very rare. I think it is very desirable, by the publication of this paper through every branch of the navy, to let them know what is the reckless waste of life of their fellow sailors which takes place annually on our coasts. For many years it has lain on my own conscience and feelings as deeply and as heavily, if not more so, than any other subject which I have ever entertained; and I entertain it as a most grievous, wicked, reckless, shameless charge upon the whole community of England, from John O'Groat's house to the Land's End, that in a christian nation these things go on year by year. There is an exemption. When I include John O'Groat's as well as the Land's End, it is clear from what has been put before us, that the seriousness of such things as wrecks with great loss of life is duly entertained, is comprehended within the law and within the action of the law of Scotland. And great honour be to Scotland for it. She sets an example to the sister kingdoms that ought to make them blush, if they can blush. I had occasion the other day to speak upon this very subject at the Institution of Naval Architects, where it was brought forward, and where again I hope in a short time there will be another movement made in the matter. We were stirred, and the whole heart of England was stirred, by the loss of the "London." Well, that is a distinct case, and I may venture to say a special and an exceptional case; it was a case of foundering in the open sea. These cases are rare; in fact more rare than the proportion of cases which stand on the wreck chart, from 1860 to 1863, of the wrecks upon our own coast. We all know that all wrecks and collisions have of late years been taken notice of, officially; returns are made of them by whomsoever it may be, and they arrive at the Board of Trade. At the Board of Trade they are printed and recorded in a report; that report is accompanied by a chart of the positions upon the coast where the wrecks occurred, and that wreck chart is presented to Parliament every year. As to how many of them are put into the fire, or put into the waste paper basket as soon as presented, no one can tell; but I ask any person here, and I wish the appeal could be made even to more extensive portions of our community, as to whoever heard that any notice was taken of the wreck chart. I never did. I never saw the thing mooted, and I never heard it referred to, or any notice taken of it, in Parliament, and so the thing goes on, from year to year. Now, these wreck charts are terrible things. They are very late in being compiled in the first place,—it is only within the last few weeks that the report and wreck chart of 1864 has been published.

The CHAIRMAN: Will you keep to the question, if you please.

Admiral HALSTED: I am afraid I do not know what the question is unless I am speaking to it.

The CHAIRMAN: The question is the remedy for shipwrecks.

Admiral HALSTED: The remedy for shipwrecks! You may as well ask me for a remedy for—what shall I say? I do not pretend for one instant to be able to provide a remedy, and I do not know anybody who can undertake to say what is the remedy for shipwrecks; but I will tell you this, that if I could go upon the Stock Exchange to-morrow morning, and by holding up my hand could put a stop to all future shipwrecks upon the coast—I am not speaking unadvisedly—it would be a question how I should get safe with life off that Stock Exchange. I do not know whether there be present or not, a party more interested probably than most of us, who I may term a representative underwriter of Lloyds, and with whom upon this very subject I had a very interesting communication of some hours not more than a week or ten days ago. When I put that position to him, he said, "It is perfectly true, you would stop our bread." I may say that this is not at all an individual case. The other day I met at dinner a deputation of the authorities of Glasgow, where I have been trying to moot this very question for several years past. I put the same question to them. I said, "Will you let me off scot free if I go upon your Exchange, and by holding up my hand produce the effect of putting a stop to our constant shipwrecks?" They said, "No; we will not let you off at all." Now, I say there is the question; there is where one of the remedies lies. And a remedy lies in another direction, it is of no use to talk of a remedy unless we know where the disease is. There is the statement which was made to me the other day openly; it was not in secret; it was said openly and publicly at Lloyd's, that the whole question of our insurances did involve more or less of fraud, and that ships are purposely wrecked—ships are purposely wrecked. (Hear, hear.) I said to my friend, "And I can tell you one place where they are purposely wrecked, as a matter of preference; that is Table Bay, by the Cape of Good Hope." (Hear, hear.) It is covered with wrecks. Wreck upon wreck is purposely provided for and prepared, to take place upon that coast. The only remark made was that there was a great deal more fraudulent action in the case of insurance, so far as foreign countries are concerned, than so far as our own country is concerned. However that may be, the result to ourselves is this, that as we sit here, almost during the period that this lecture and discussion will endure, there will have been a fatal wreck, upon the average, upon our own coast of England. I am speaking from memory. The wreck chart for 1863 involved, I think, upwards of 2,000 wrecks upon our own coast. The wrecks for 1864—again I am speaking from memory, and, therefore, under correction—amounted to upwards of 1,700, so that it is a matter of fact that every four hours during the day there is, on an average, a fatal wreck upon our own coast. What there may be on other coasts under a system far more fraudulent I do not know. I am sure it is bad enough with us, and we have enough to do to deal with our own evil. All this I take it is within the scope of the discussion.

The CHAIRMAN: All that you are saying only goes to prove what the paper has proved—the necessity for interference. Admitting everything that Admiral Halsted says to be true, but which I do not admit, it only makes it the more necessary, the more urgent, that there should be some legislative interference to put a stop to that which is fraudulent, and which is accompanied by so much loss of life and property.

Admiral HALSTED: I think you should permit people to speak. However, I will bow to you, and will hold my tongue. All I say is that for 15 years past I have been working at this thing. I shall be very happy to hear what any body else has to say.

Admiral RYDER: I imagine that Admiral Halsted is going to draw our attention to a change in the law of insurance.

Admiral HALSTED: That is so. It is in connection with this view of the question—the insurance—that I mooted the thing here in London, and I mooted the thing in Glasgow, as our second largest mercantile community. I had elicited a very strong feeling of reproach at the state of things as it is, and in both cases it has been suggested by parties, as a means of bringing this matter home, that the insurances might be effected in such a way as to induce the greatest possible care that no life should be lost. It would be perfectly incompetent for me—I do not for one

moment pretend to lay down the means by which this should be done, but upon both occasions, whether here or in Glasgow, it was said by parties who themselves were not only concerned as habitual underwriters, but who felt the charge which lay upon them in the business, that they had no desire that that which was their own mode of livelihood should unnecessarily and recklessly and inconsiderately be mixed up with the absolute loss of life. Here, then, I think again (with all due deference to the limitation which has been proposed to us), that this great question ought to be looked at from more than one or two points of view. I think insurance is a mode of action in which a very large amount of remedial measure might be taken, and very effectively, by the legislature. I have reason to think, so far as my own limited means have been concerned, in investigating, examining, and discussing the question, that there would not be any objection whatever to cause the insurance of property to be made in such a way as to make that insurance unfavourable to the realisation of profits when it involves loss of life. I do not know whether I have made myself understood, because I have no plan or detail, or anything of that sort; but I think that that might be done. If I may be permitted to say so, although it does not come within the scope of the remedies proposed, I believe there is another remedy which is equally capable of being worked out, and very largely and effectively as regards the question of the ships themselves. I am confident that a very large proportion of the wrecks that take place are in consequence of ships not being seaworthy; (hear, hear) in consequence of ships being overladen; and in consequence of ships, where not overladen, being improperly laden, as regards the character of the cargo. I know it is absolutely so. I have been in intimate communication and friendship with an officer in our own service, Captain Schomberg, who was for many years the emigration agent at Liverpool. There he did his duty so fearlessly and in such a manly way, that at first he was subjected to a very large amount of prosecution, and had frequent actions at law for his interference with the lading of ships; but he proved his case in every instance so clearly and so distinctly, that the result of his administration of that interesting and important office at Liverpool was, that every vessel had to be laden under his special directions. He saved ships upon ships in consequence; ships upon ships were brought back, were examined, were unstowed, and the unsafety of the mode of their stowage, as regards the question of "dead weight" (like the iron in the "London"), was proved and altered. There again is the question of the overloading of the vessels themselves. And what is the cause of it? Every ship that I ever sailed in, from a midshipman upwards or downwards —whichever it may be—I declare there was a load-line for every ship, and it was known to everybody on board when the ship was down to the load-line. There is a doctrine gone forth that it is difficult to fix a load-line for a merchant ship. I utterly deny that there is any such difficulty. In speaking now, I am having reference to a very great friend of mine, the late chief engineer of the dockyard of Woolwich, he also has tried to remedy the question of our numerous wrecks; he says, one large and great means of that remedy is that ships should not be permitted to go to sea laden beyond the definite fixed load-line which is necessary for their protection and safety. He has fought that battle for years consecutively, to my knowledge, at the Society of Arts; and who have been his opponents? Shipowners and shipbuilders. I declare that it is true; shipowners and shipbuilders have been the parties who have declared a fixed load-line to be impossible; and yet, there is not a single ship in the navy, from one end to the other, in which it is not invariably known by every man, woman, and child on board (if there is any woman or child on board) what is the load-line. My friend has traced back the original object and purpose for which tonnage was first instituted. I am speaking from recollection now, but I think it can be traced back to the reign of Edward the First; that it was first instituted as a measure in the coal trade when coals were first introduced into London from Newcastle; and that the vessels, so carrying that dead weight of cargo, were marked on their stem and their stern, and amidships, to a draught of water which was then considered safe for the navigation between London and Newcastle; and below that they were not allowed to be laden. At that time,

that amount of lading was absolutely measured by pig iron of a certain weight and hence the institution of tonnage. That was the way in which the measurement of tonnage was originally introduced as regards shipping; not with a view of fiscal operations into which it afterwards merged, but with the view of absolute safety. Now, I do not think I am out of order in saying there is yet another remedy, although it is not a legal one. It refers to the whole question of our lighthouses. It is a very curious thing, that when our wreck charts were first put forth, it came out that the greater portion of our wrecks and collisions absolutely took place round our lighthouses, which are erected for the ship's safety and not for the ship's loss. One would say, how can that be? The answer is perfectly clear to all those who have ever had the anxiety of navigating a ship in our narrow waters, in our foggy and dark climate. You come in from sea, not having had observations for three or four days, you take soundings in the channels; but where on earth you are, you do not know, and your only chance of correctly knowing where you are when knocking about in the fluctuations and changes of the tide, is to get well in with some well-known spot of land; and the safest spot which you can get in with, under these circumstances, is some danger light. If it is thick weather you are bound to run in to some light until you make it. After you run in a certain distance, you know by your soundings that you are nearing the land, and you go creeping on like a moth round a candle till you strike upon the rocks round the danger light, which is erected for your safety. For more than thirteen years I have been concerned in working this part of the question, or assisting in it. It is twelve years ago since I had occasion to speak at the Institution of Civil Engineers, for several nights, in battle with the Trinity House and its authorities, contending that it was possible to have safety lights as well as danger lights. They have adopted that particular principle of suspension of buoys, and of larger beacons for the last few years, which only requires expansion to be as perfectly applicable to a system of lighting each of our channels—St. George's Channel and the British Channel—with a line of safety lights along the centre of the channel. You not only affect the hazardous question of striking the land, but you have a point of safety to navigate for, instead of a point of danger. And involving this again; that it may be rendered perfectly practicable, and perfectly easy, to have a right of road, as it were, so that incoming vessels may take one side of that safety line, and outgoing vessels the other side. In addition to the prevention of striking on rocks, these safety lights would also diminish the chances of collision. These are a few remedial measures, and in bringing them forward I do not think I have transgressed the limits; yet there is one more. It is only possible, by a combination of measures, that this great evil can be amended. There is on the table a lifeboat of that nature and description, that when the ultimate crisis arrives of endeavouring to save those who have been placed in a position of jeopardy by wreck, they may have, available, their own lifeboats to any extent which it is possible or reasonable to expect. I have worked at this question also for the last twelve or fourteen years. There is a model of a lifeboat on the table there, the inventor of which —and all honour to him—has been induced to expend his talent upon it, upon the express ground of meeting the question of our terrible annual amount of wrecks. That lifeboat is one, of which, I will venture to say, you may put them away, almost like books in a bookcase, as many as shall be necessary to save the life of any ship's crew, or ship's passengers. At this very table, in a discussion with the late Mr. Brunel, it was determined to suspend a series of these lifeboats along the whole length of the sides of the "Great Eastern," to an extent which would have floated 2,400 people. My friend, the Rev. E. L. Berthon, is the inventor of this lifeboat. He is a clergyman, the present Vicar of Romney, the late Lord Palmerston's parish. I have asked him to be present to-night, and to bring this model with him. I have endeavoured to get the boat adopted by the Admiralty: it did get to a certain point of adoption, and then, like everything else, as it carried with it no political votes, it ceased to be valued merely as a lifeboat. I think I have detained you quite long enough, and, therefore, I will make no further remarks.

Mr. GRAY: I wish to make a few remarks upon the subject of the paper which we have heard read to-night. I may say at once that I do not agree with Admiral Halsted that the country has neglected to give attention to the lamentable state of

things which effects such loss of life and ships. We have had Committee of Enquiry after Committee; we have had Commission after Commission; and we have had Special Commissions to inquire into the subject of harbours of refuge. Beyond that, officers in the United Kingdom inquire into and report upon the causes of every wreck that happens on the coasts. Those returns and reports are compiled, and are made up into the Blue Book, which is presented to Parliament. I do not see how Admiral Halsted can say that the country has neglected to consider the lamentable loss of life arising from shipwrecks on our coast. But I do say that we have perhaps been going on the wrong tack. We have all along been relying on Government inspection and Government supervision, instead of relying on the responsibility of the owners and of their servants. (Hear, hear.) If the House of Commons were moved to throw aside all those conventional ideas of protection and inspection, and hold the shipowner responsible for the loss of his ship and for the loss of the lives of his crew, then, I say, our shipwrecks will diminish, and our loss of life will be diminished also. But there is a great fault, and, in my opinion, that fault lies with the underwriters. I do not wonder that Admiral Halsted said that he never saw or heard what became of the wreck charts, because his experience is chiefly among underwriters.

Admiral HALSTED: I denounce them as sinners.

Mr. GRAY: Admiral Halsted denounces them as sinners. Being a very active one among them I presume he is able to speak upon that point. I will not detain you beyond one point, and that is, that the paper before us, which has been so ably and so logically arranged, refers to a paper that I read before the Society of Arts as a paper that emanated from the Board of Trade. I wish on behalf of myself, to say that that paper does not emanate from the Board of Trade. It is a purely personal matter; it was written by myself as a Member of the Society of Arts. Whatever blame attaches to that paper attaches to me; whatever credit attaches to that paper attaches to me: I believe that we are on the right tack, and that if we go on as we are going on, we shall soon be able to get rid of these pernicious regulations, and shift the responsibility on the shoulders of the right persons.

Captain SELWYN, R.N.: I entirely agree with the writer of the paper, and with Mr. Gray in wishing to see that course followed with regard to these restrictions and regulations which has been so beneficially followed with regard to all our modern legislation—the sweeping away of petty restrictions which have too long acted against our commerce, instead of for it, and substituting for them an efficient responsibility, which shall be always fixed on the right parties. But in order that that may be done, the other suggestion which has been made by the lecturer, of the application of the common law, is most desirable. Our common law provides juries for the trial of all common cases. It provides scientific juries for the trial of all scientific cases. But as long as only two gentlemen, called "nautical assessors," sit for the trial of these cases, who have themselves for some time past left the sea, who are not conversant generally with the requirements of iron ships, and with many other circumstances which day by day spring up, so long they will be inefficient persons to decide the merits of the case. If for that be substituted a jury chosen at the time, which may always, I hope be found in any maritime port, a jury of shipmasters, aided, as I think they will acknowledge that they may be, by certain naval officers, who may be held to be outsiders, and therefore able sometimes to see a little more of the case than those directly interested, then, I think, you will find that the same result is obtained, and that the same lucid decisions are arrived at as to who are really responsible, as are arrived at by scientific juries in other scientific cases. The lecturer has cited words which bear rather hardly on seamen, and as we are naval men, belonging to this Institution, it becomes us to put in a little word for our brothers seamen. Seamen are not responsible for the un-seaworthiness of their ships. They are not responsible for the drunkenness or the ill condition of crews, so long as by changes in the navigation laws those crews may be shipped at the last moment, may be composed of foreigners derived from all parts of the globe, many of whom do not understand one word the master speaks to them, and who can hardly be efficiently stationed and exercised at their stations in case of danger, so long as they are only held together by the slight bond of a short voyage,

afterwards to be scattered to the different quarters of the globe from which they came. The words of the eminent legal authority who was quoted, also bear hardly on the question of along shore navigation, because, as was to be expected, it was not clear to a person not acquainted with the state or structure of steam ships how often the compasses fail to indicate the course which the master intends to steer. And although it be true that when near the shore at night, to a landsman's ideas, the ship might be steered by the shore, yet seamen know very well how little the shore is attended to, how unreliable is the apparent distance of that shore from the ship when the night comes on, and how lights are approached on a false bearing, because compasses are not true. All these questions would be decided by scientific juries. They can never be decided by legal authorities, or by those not acquainted with navigation.

Rev. E. L. BERTHON: As a stranger, may I be allowed to say a few words. I have listened with a great deal of interest to this discussion, and although I am not unaccustomed to this place, for I have on former occasions, at several different times, occupied the place which has been so well filled by Mr. Lacon to-night, I dare say you will allow me to say a word or two. I will keep to this point, the legislation that has been spoken of this evening, for the punishment of culpable neglect, and for the providing proper means to secure the lives of those who go down to the sea in ships. I think also something may be done by the Legislature towards the prevention, as well as towards the cure of these evils. It is to this one point only that I will speak. As long as it was impossible to prevent it, there was no help for it; but now that it is no longer impossible, it should be held necessary on the part of all those who fit out ships for emigrants, troops, and passengers, that they should provide sufficient accommodation in their boats, and that no ship should be allowed to go to sea without a refuge of some kind for those human beings who are within those ships; that they should not send away a thousand persons, be they emigrants or troops, in a single ship, knowing their lives are committed to the integrity of that ship—that, as long as she floats they are safe, but if she goes down, from fire or collision, they are all lost—without means of safety being provided. At present our ships are not provided with half boats enough. What is the use of putting on a ship, with five hundred human beings on board, boats that will only save three hundred? You would hardly save the three hundred under the most favourable circumstances; but under such circumstances as I have mentioned, you know they will be overcrowded; and in the confusion they will be swamped, with the sacrifice of the lives of those on board. The poor creatures know there are not boats enough, they know that only a certain number can be saved, and hence the crowding and scrambling which takes place, and which results in the boats being swamped. May I be allowed to explain this lifeboat?

The CHAIRMAN: After the discussion on the paper.

Captain CRAUFURD, R.N.: Mr. Chairman, at this late hour of the night, it would be perfectly fruitless to attempt to state to the meeting facts which bear practically upon the question. I regret very much that you have limited the discussion, because I think the importance of the subject is so very great, that the mere bringing forward and discussing it for an hour, or an hour and a half, cannot produce the good that the author of the paper wished to produce, and therefore I beg to move an adjournment of the discussion.

The CHAIRMAN: I submit we cannot but adjourn this discussion. Gentlemen have mistaken the object. What is the operation of the existing laws? The operation of the existing law is, that it has made certain regulations, such a one, for instance, as this one proposed by Admiral Halsted. Now, that is just going in the very opposite direction to that suggested by the paper; and the evil of that direction has been distinctly shown by the paper; the verdicts, except in the Scotch case, having been, that the captain and owners have been absolved from all responsibility in the matter. The operation of such regulations should be merely as protests for prevention, and not to protect captains, owners, and men from any responsibility to the law whatever. Take the case in Scotland. In Scotland, though you have all these regulations, you cannot, in the face of the law there, say the owner is not to blame, the captain is not to blame, because he has been sailing according to trade regulations. Common law

has overridden that, and the Procurator Fiscal will say, "Here is the common law of the land and you cannot interfere with that"; and he will hold these people responsible notwithstanding. Take one of these particular points just mentioned. Admiral Halsted supposes by having a load-line you prevent the loss of life. (Admiral HALSTED, No; No.) Admiral Halsted offered that as one of the remedies, the propriety of introducing a load-line. It may be granted, but I say that it is not necessary. If you hold the masters and owners responsible, that will come within their responsibility, and a hundred other things besides, that you cannot legislate with respect to. You are going in the wrong direction, because the very thing you have not legislated about, is the very thing that will cause the next disaster. If you fix responsibility, and insist upon that, and have a public prosecutor who will carry home that responsibility, then the Board of Trade may say, "I don't care how you go to sea. I will hold you responsible if the ship is lost and the lives in it." That is the real point. Have inspections, and advice, if necessary, but recollect, that the advice does not absolve you from any responsibility. It intensifies all your responsibility. That is the only law. Any other law will be injurious.

Commander COLOMB, R.N.: May I make one remark to reconcile what the Chairman has said, and what Admiral Halsted has said, because it seems to me that the Chairman has missed the point of Admiral Halsted's argument? Admiral Halsted stated, at the beginning, that he put aside the legal question not being a sea lawyer himself. Then he went on to suggest certain matters which should form part of the law, in the ascertaining of the transgression of which by a scientific jury, the culprit would be judged innocent or guilty. Now the load-line would be one of those matters which the jury would have to inquire about and to ascertain.

The CHAIRMAN: I think I have not missed the point. It is you that have missed the point of the paper. The point of the paper is this: Legislation or no legislation. If you are to legislate at all, do not relieve the persons who ought to be responsible from being responsible. Now, the question to discuss is, whether you will, as Mr. Gray says, continue to go on in the wrong direction, or whether you will return and go in the right direction. Mr. Stirling Lacon says that they have got the right direction in Scotland, and we are going in the wrong direction in England. Mr. Lacon excludes secondary points from his paper. The point is to discuss the paper, not to discuss everything round the world.

Mr. LACON: My proposition is this, not to let anything stand between the public and the law.

Mr. SCOTT RUSSELL: As I unluckily shall not be present at the adjourned meeting, and as I came here not to speak but to learn, I hope you will permit me just to ask one or two questions, which it is most important for me to learn from you. I am not a sailor. You are sailors. I want to know from you what is wrong; I want to know why you lose ships, because observe, you lose them, we don't, we only build them. But if you lose them because we build them wrong, then we are to blame, and not you. (Hear, hear). Not only that. We build ships, but we often own them ourselves. Not only do we build and own them, but we often insure them ourselves. Therefore, if you please, I have a right to ask you, as builder, as owner, and as insurer, why you lose my ship? I think I have a right to ask you that; and I come here because I think here you will have the courage to tell me why you lose my ship? (Hear, hear.) Now I am quite willing, as shipbuilder, as owner, as insurer, to take my own share of the blame, if you will tell me where I am to blame. I think you may remember that Mr. Disraeli said, that the only way to get a decent house built in London, was once to hang an architect. If you please, I want to know from you who is to be hanged? Now, I will tell you that the builder of the "Orion" was not the man to be hanged, because I know all about the "Orion." I happen to know all about her owners, all about her builders, all about her insurers, all about everybody but her captain. Now, I tell you that the owners were the best owners in the world, the most liberal owners, the most successful owners, and owners who insure most of their ships at their own cost, and owners who have done more for the advancement of the mercantile steam navy of Great Britain than any other owners. I will

tell you who they were. They were the owners who founded and have carried on to this day the Cunard line of steamers between England and America. They were the same people, but they were not the same company. They were the same people but they were not the same name. Yet they had one of the most disastrous shipwrecks, that is on record. Now, then, that was not the blame of the shipbuilder, it was not the blame of the shipowner, it was not the blame of the ship insurer. I want to know from you all about that. It is your business, not mine.

CHAIRMAN: That has been the object of the paper—confined simply to that.

Mr. SCOTT RUSSELL: Therefore I speak of that. The next is the "London." I know all about the "London;" that the owners of the "London" were rich, liberal, reputable, successful people. I know that they were not only owners, but large insurers of their own ships; and I believe their ships to have been well built, and well found. Now I want you, as captains, to tell me why one of your craft lost that ship in the open sea. (Hear, hear.) I say am I to blame as shipbuilder, am I to blame as shipowner, am I, as ship insurer, to blame, or are you to blame? I think that concerns you. (CHAIRMAN: Quite.) Now, if you like, I will tell you where the shipbuilders are to blame. We shipbuilders are very much to blame when we agree to build a ship for a shipowner because he pays us well; and when in agreeing to build a ship, we know that we are agreeing to build a ship that is by no means the best ship we could turn out. I say we are to blame whenever a shipbuilder agrees to build for an owner a cheap ship, or a ship that he knows is by no means as seaworthy as another ship he could build; he is to blame, therefore, in these circumstances. Will you be kind enough, as captains, to let the public know when the shipbuilder is to blame for the loss of the ship? Now I go to the next point. The shipowner is to blame, first, when he doesn't select a man of standing, capacity, experience, and skill for his captain. (Hear, hear.) He very often takes a cheap man. He very often takes a subservient man; he very often takes a man, who being subservient, will do what he is told instead of doing what he knows is right. (Hear, hear.) Now I say when the shipowner selects as captain an inferior class of man, you, the sailors, you, chiefly the sailors of the Royal Navy, who know what a ship captain is, who know what he ought to be, who know how he ought to be treated, who know how he ought to be paid, who know what his standing and position ought to be, in order to do justice to himself, to his owners, and to the public, I say you do wrong when you do not speak out, and when you allow captains of the merchant navy to be put down, ill paid, ill conditioned, and not put in proper circumstances to man and sail their ships properly. That, I say, is your blame, Gentlemen, and you ought to speak out a great deal louder, and a great deal more emphatically than you do. Now we come to another duty of the shipowner, but which, I think, is rather the duty of the captain, and which, I am sorry to tell you, captains do not attend to. You captains continually take ships to sea without having yourselves any preliminary knowledge whatever of the structure and nature of the ship that you take to sea. I say you are all immeasurably to blame for doing so. You do not know the shape of the bottom of your ship, so that you do not know where you are to put her, nor do you know what to do with her if you have got to take her into dock. You do not take the trouble to know what is the displacement and the carrying power of each division of your ship. You do not take the trouble to know how much you can stow in one part of your ship and how much in another without destroying her qualities, without destroying her trim. You are cowardly enough to take command of the ship, and not to tell the owners of the ship that they have not given you the information. (Admiral HALSTED: The Admiralty.) I didn't say the Admiralty; but I tell you you ought to speak out, and you ought to say this to your employers—I am talking to you as if you were merchant ship captains, instead of being Royal navy captains—you ought to say to your owners, whoever they are, "When you put a ship into our hands, put into our hands at the same time, along with the ship's papers, all the information which we, as seamen, ought to possess in regard to every point of the quality of our ship—let that be part of the ship's papers." Why don't you do that? Have you any good reason why you don't do it? I don't think you have. I say you are afraid of your owners. I say one of the great evils of your profession is that you are afraid of your owners. The next point I come to, is this. I think as captains you ought first of all to know

what sort of ship you sail in, and I think, secondly, as captains you ought to see to the stowing and trim of your ships. You do not do that. If you are merchant captains, what you do is this. You allow the owner, who is probably entirely ignorant of his business, to make a contract with a man who is called a stevedore. This stevedore cares nothing about your ship. He knows very little about her. The bargain with the stevedore is that he shall stow the ship at the least possible figure of money per ton for the weight he puts into the ship. The consequence is, that if stuff goes down to be put into the ship, it is put into the part of the ship into which it can be put at the least possible cost. The captains either have not courage enough, or have not knowledge enough, to say "this shall not be done to my ship, and that shall not be done to my ship." Now is that your business, or is it mine? What has the shipbuilder got to do with it?

The CHAIRMAN: The question is rather whether it is the business of the Legislature?

Mr. SCOTT RUSSELL: I will put it so. Is that the business of the Legislature, or the captain's business; is it the owner's business, or is it the business of this meeting, or whose business is it? All I can say is, it is not mine, the shipbuilder's. Now then on all these points I think you sailors are bound to give us definite information. If you leave this place without having told us—not the insurer's duty, not the shipbuilder's duty, not the shipowner's duty; but if you leave this place without having told us what is the captain's duty, what is his position, what is his knowledge, what he ought to submit to, and what he ought not to submit to, what, as a professional man, he ought to attempt, and what, as a professional man, he ought not to go to sea without—I say if you leave this place without plainly telling everybody how they ought to put the captain in such a position that he can ensure the safety of his ship and his crew, you leave this room without having done your professional duty, or at all events, without having given me the information which I have come here for the purpose of obtaining from you professional men, namely, as to what it is necessary that those about you should give you, in order that you should be properly and fairly responsible for your ships. I tell you honestly, as one of your friends, one who has known you all my life, and one who esteems a good captain a good deal more than I do a good ship; I tell you this, that you have allowed yourselves to be put upon, you have allowed yourselves to be made responsible for the sins of other people to an extent which, I think, it is utterly unworthy of professional and high spirited gentlemen, as I know you are, to submit to.

Captain SELWYN: I rise one moment to say I utterly deny that the observations of Mr. Scott Russell can with any propriety apply to a naval officer. I am proud to say of my profession, that there is not a single captain of the Royal Navy who has anything above ordinary talent, who does not make himself thoroughly acquainted with his ship, and the character of her stowage, and who does not know her very much better than he does the characteristics of his own wife. (A laugh.)

Mr. SCOTT RUSSELL: Allow me one observation. I really wanted to make you responsible as a profession for the merchant navy, as well as your own.

CHAIRMAN: How can you make out that we are responsible?

The debate was then adjourned till the following evening.

ADJOURNED MEETING.

Thursday Evening, May 3rd.

REAR-ADMIRAL A. P. RYDER, in the Chair.

Mr. LACON: I have been requested by Captain Fishbourne, who is unable to attend this evening, to read this letter which he sent to me this morning:—

"My Dear Lacon,

"I am sorry that my leaving town to-day will prevent my being with you to-night.

"I would, if I were you, endeavour to bring the question raised in your paper "again before the meeting, to show what is the real point for discussion.

"Your paper has raised a point involving a distinct principle, and till the principle "is decided, discussing details is *ignoring* the paper.

"The question, I apprehend, is this, shall the Board of Trade continue 'to meddle "and muddle,' relieving owners, masters, and men from all responsibility, without, in "fact, taking it upon themselves, for the Government is irresponsible, or shall they "withdraw from interference, further than to supply a public prosecutor to bring "home to all, their respective responsibilities.

"To my mind, all that was said about details only goes to prove the inefficacy of "the present state of Board of Trade interference, and that any extension of it, so "far from mitigating the evils, would increase the number of cases in which rela-"tives will receive, n answer to their demands for justice and protection in the future, "verdicts of homicide (justifiable) against the Board of Trade.

"The little chance of agreeing in details may be seen from what took place last "night—sailors throwing the responsibility on shipbuilders and insurers, and they "throwing it back on sailors and naval captains in particular.

"If the law is to extend the right of interference of the Board of Trade to the "arrangements about stowing the ships, why not to the building, masting, &c.? but "this would fail, and you must go on still further and still further, relieving owners, "masters, shipbuilders, seamen. stevedores, &c., from all responsibility. I would as "soon arrange that the Board of Trade should sling men's hammocks and put them "to bed, as many of the things that have been proposed, and if some of them are "not carried out, marking load-lines would be a delusion, as a ship may be down on "each of two occasions to this point, and be a good sea-boat in one condition, and "immeasurably unsafe in another state of stowage.

"Very truly yours,

"E. GARDINER FISHBOURNE.

"There ought to be an end put to this fatal system of nursing."

Would you allow me once more to state the issue raised in the paper. I put it to you last night distinctly that in all cases "there should be one registered proprietor "or managing owner; that in the loss of life at sea, evidence of the death should "supply the place of the *corpus delicti*, and that some efficient machinery should be "established whereby the common law of the land should really and truly be brought "into operation, for offenders in the words of the Scotch judges, as quoted in the "paper, must answer to the law." Or, in other words, whether responsibility should attach to the owner, captain, and crew, or to the Government, who are in the matter an irresponsible body. That is the object of the paper, and to discuss anything else is as wide of the point, I consider, as to talk about the Crystal Palace.

The CHAIRMAN: This is an adjourned discussion. I am not familiar with your practice, but I have no doubt the rule here is that the gentleman who moves the adjournment has the first claim on your attention. In that case Captain Craufurd is entitled to open the discussion.

Captain CRAUFURD, R.N.: Mr. Chairman, it appears to me that the discussion upon such a paper as this should not be a limited one, and I very much regret to hear that the points discussed last night were considered irrelevant to the question. The paper is headed "On the Loss of Life at Sea, and its Remedy." That was clearly understood to open a discussion upon the whole state and condition of the mercantile navy of this country, its want of discipline, and its want of organization. As to whether the Government should interfere or not, may be a question. I believe the Government ought to interfere in a question affecting the lives of the subjects; but that the Government should not interfere too much. During my service for some years past my attention has been called to some want in our merchant shipping—something to prevent the effects which I have seen, and I am speaking more particularly of merchant ships out of England. Naval officers, by Act of Parliament, have a certain amount of power, certain instructions where they may interfere for the protection or

for the good order of the merchant service. From what I have seen myself, my thoughts have been frequently attracted to the subject. I have lately returned from a three years' residence in Rio Janeiro, where such things occur, as I am perfectly convinced the public in England are not aware of—things which, although reported on, the reports perhaps lie in the waste-paper basket. I consider that if every officer who in the course of the performance of his duties abroad, sees things which he believes to be wrong, he does not do justice to himself if he does not bring those things forward, and tells what he sees; and when opportunity offers, states his opinions as to what to him seems to be the remedy; always under correction, because we cannot all be presumed to be legislators; we cannot all be presumed to be infallible men; but if we are honest, right-thinking men, it is our duty, if we see these things, to speak of them. I was therefore very much gratified, shortly after my arrival, to be informed by Mr. Lacon that he was going to read a paper which touched this very question upon which I had been thinking so much, because I had been much impressed by what I saw, when sitting upon naval courts assembled to try captains and mates supplied with certificates from the Board of Trade. The other day a certificated captain at Rio lost his ship through sheer neglect. That ship was employed by a foreign Government to convey four hundred troops, therefore there was a greater responsibility thrown upon the shoulders of the captain. That ship, with a position at noon ascertained by observation, followed a course which could not put her anywhere else than where she was at 10 o'clock at night—that is on the beach, on the coast of Albardao, on the very same spot where the "Prince of Wales," (the cause of a difference between Brazil and England), was wrecked. That captain declared to the Court that he was not aware before, that there was a change of deviation in the compasses of iron ships between northern and southern hemispheres, a fact which naval officers know is well ascertained. The use of the lead was also completely discarded. But there was another point, which touched the discipline of the ship. The chief mate believed the ship to be in danger, but did not consider it to be his duty to warn the captain, but declared on oath before the Court—the testimony is now in the hands of the Board of Trade—that he considered that as the master of the ship was responsible for the ship, he had nothing whatever to do with the navigation, nor was it his duty, if he saw the vessel in danger, to point that out; and that if he were the captain of a ship, and anybody attempted to interfere with him, he would tell him to mind his own business. I will speak as much as I can towards the point of the paper, because really, as the Chairman put it last night, I am puzzled to know what we are discussing. The paper has stated facts in a very able manner; but these are facts which have been registered, which have been published, which are known. I was surprised when I heard that the loss of the "London" caused such a tremendous sensation through the country. Why, Sir, have we never before lost two hundred lives through shipwreck? But one thing about it did strike me very much—that 5,000 miles from England, out at Rio Janeiro, a sort of voice, a whisper came—"Is it not strange that a large ship like that should be lost, and yet a small cockle-shell of a boat should live in that sea." One is left to draw one's own inference. If a remedy is to be found, before you can find the remedy you must first find out where the shoe pinches. There are a great number of cases—some were named last night. I wish to confine my remarks more particularly to the question of discipline. I do not believe that the system of shipping men—the present system of the employment of merchant seamen—is one that can ever prove successful for anything like discipline, or that even the best captain in the world can be assisted in carrying out his duties, in the way in which merchant ships are now manned. I have had men coming to me at Rio Janeiro shipped on board American ships, and the same thing occurs in English ships. The master of a ship wants two or three men; the shipping master has got hold of a sailor. I need not say what everybody knows—that Jack is a child when he gets on shore; he throws his money broadcast, spends it all, and then, when he is starving, he finds himself in the hands of crimps, or worse people than crimps. These crimps make money out of his misfortunes. Talk about the slave trade, I think it is a disgrace to England that the system of shipping seamen should remain as it is. The evils may appear small, but

they are broadcast over the ocean. Perhaps in England they are not so palpable, as they are abroad; but any one who happens to have experience of them who takes the trouble to ask one of these men how he came where he is, will find that they are taken off dead drunk, shipped on board, made to sign articles, or perhaps signing no articles at all, and when they awaken to their senses twenty-four hours afterwards, they find themselves on the high ocean, engaged for a voyage of 5,000 miles away from England. There is a power of summoning naval courts, which by the Act of Parliament is worded to mean so far as my humble apprehension reads it, that the power of summoning a naval court is in the hands of a Naval Officer, where there is one present, and where there is not one present the power is in the hands of the Consul. I state this because on one occasion lately I unfortunately differed from her Majesty's Consul as to holding a naval court. I saw the necessity for it. The captain of a ship came to me, and I, believing that it was fair he should have a naval court, decided to have] one, and a court was held. I may mention in passing that the case was that of the burning of a ship on the line. As a specimen which does honour to the merchant service—I hope it is not an exceptional case—I may mention what occurred. The crew were saved by a French vessel, the captain of which behaved in a most gallant manner. After an investigation we found that the discipline on board the ship was perfect, that the cargo was properly stowed. The cargo was iron and crockeryware. The ship was bound to China; she caught fire; the best means were adopted to put out the fire; there was no shirking, there was no panic. The French captain said that when he went on board he saw they could not save the ship, but he said he would lay by, until the captain and crew came to him, wishing not to prevent the men trying to put the fire out. The French ship lay by two days and nights until the burning ship could no longer hold the captain and crew. I say all honour to that man for doing what he did, an act not often found among merchantmen. On that occasion this English captain came to me, and I thought it only fair that a court should be held. I happened to preside at the court, and after a very careful investigation we could not ascertain the cause of the fire. The Consul's objection was that he had taken a protest from the captain of the ship as to the circumstances, and had decided in his own mind that it was a case of spontaneous combustion, and that, therefore, there should be no naval court. The naval court differed entirely from him. There was no evidence of spontaneous combustion, and the court came to a decision that they could not (as in the case of the "Bombay") give any explanation of the cause of the fire. This difference of opinion between the Consul and myself he thought proper to report to the Board of Trade. I was very glad he did, because if I was misinterpreting the Act it was quite right that he should call attention to it. I believe the answer of the Board of Trade was that they regretted there was a difference of opinion between the naval officer and the Consul, but called his attention to the wording of the "Act." I quote this in passing as one of the instances of the want of some organized system affecting the merchant service. The question of discipline is one of great importance, and here I may refer to the high state of discipline in her Majesty's ship "Bombay." I cite this as an example of what discipline can do. That ship met with a calamity under circumstances which are perhaps unparallelled in the annals of the British or any other service. She was a fine man-of-war, and within thirty or forty minutes from the first discovery of the fire, everybody was driven out of her. But they were not driven out in a panic; the boats were hoisted out in less than eight minutes, and when all was done that could be done, and the order was given to leave the ship, nearly all the men deliberately stripped, and took a "header" into the water. Acts of gallantry were performed by many of those who could swim to assist those who could not. I say the occasion should be remembered with honour, because although it was a very disastrous occurrence, much gallantry was displayed and the result showed a high state of order and discipline—that out of 600 only 91 were lost. There was another instance I may mention; a Government emigration ship, the " ," came to Rio Janeiro with 300 emigrants on board. All I can say is I could not believe it possible that such a vessel could have come out of the hands of any emigration office belonging to Great Britain. She came in in a state of mutiny. She had all sorts and kinds of countrymen forming her crew.

She came in on account of this mutiny. A court was held, which, I regret to say, caused the death of the late Consul at Rio Janeiro. We sat two days, and I declare that every one of those men ought to have been sent home and tried for murder, not that acts of murder were committed, but for intentional murder. Swords and pistols were pointed by the crew, and it was as bad as bad could be. We had no power, unless we stopped the ship, and stopped the emigrants, to take these people out and send them home to be tried. There was nothing that could be done. The highest punishment that could be given was nine months' imprisonment, and the carrying out of the sentence depended upon whether the Brazilian authorities would allow us to do it. The Consul objected to passing sentence; I said let us pass the highest sentence we can, whether it is carried out or not. Sentence was passed upon them; one was sentenced to nine months' imprisonment, the remainder to lesser periods, and I am glad to say they all got their sentences, for the Brazilian authorities were very civil about it. During the sitting of the naval court, the captain spontaneously gave up the command of the ship; in fact he was a fool—he was no more fit to command that ship than a child. I may mention that after this I had great trouble in fitting the ship out there, which from the rottenness of the owners had not been properly found. I do not know who the owners were—they were men of straw. I could not find out what provisions had been put on board; there had been no account kept of "Broachings." I considered, as the only representative of the Government out there, the Consul having died, that it was incumbent upon me to take action, and whether or not, I felt I ought to take upon myself the responsibility; I inspected the ship, and found the hold strewed with straw in such a way that if any insurance office had known of it they would have refused to insure the ship. I found a want of discipline and a want of cleanliness. There were 300 men, women, and children on board. The ship had to go to Brisbane; no one knowing whether she had sufficient provisions on board to take her there. To the best of my power I made them take in provisions. Another thing about the vessel was, she had a condenser, but the coals were stowed in such a way that when she had burned a certain quantity for the condenser, they came to the reserved water, and the remainder of the coal was down at the bottom, so that when she wanted to burn more coal they would have to get the water-butts on deck in order to get at the coal. I felt so strongly on the question that I addressed a letter to the Secretary of the Emigration Board upon the subject. (See Letters 1 and 2, Appendix). I mention this case, because I think, with all due deference to Captain Fishbourne, it does bear upon the point. The question is whether the Board of Trade should have power or should not have power; and whether there should be sufficient restrictions imposed upon owners, so as to prevent this great loss of life, so as to prevent ships going to sea with inefficient men to take charge of them. The other day at Rio Janeiro, the master of a ship was so dead drunk that the owners went to the office of the Consul and complained. The Consul said, "What am I to do? I will write to the senior officer for a naval court." "Oh, no," they said, "don't do that, because we do not wish to appear against him (the master)." The Consul was rather puzzled. Before there was much time for action, these gentlemen managed to get the ship to sea, and the captain of that ship was put on board of her dead drunk the day that she sailed. Now I ask if that ship is lost who is to be responsible? how are you going to make the owner or any single body responsible? It is the system that is at fault. The state of the mercantile service of other nations appears to me to prove that they must have a better system. As a general rule, foreign merchant vessels are more creditable than the English. I regret to have to say so; I am speaking of what takes place abroad, and if we, who go abroad, do not tell our countrymen when we come home what we see, I think we are to blame. There are philanthropic men in this country who go down and visit ships, and foretell what will happen, and it does happen. But they do not know what happens abroad—they do not know the condition of the unfortunate sailor, who is thrown on a foreign shore, who is maltreated, and for whom the master of the ship does not care a snap of the finger. And as for the Consul, he is bothered out of his life by these complaints. Men come to me and complain. I say, "Go to the Consul." "Oh, if you please," they say, "I have been

to the Consul, and I can get no satisfaction." The sailor may be a bad hand, or he may be a good hand. I have had a bad hand from the Royal Naval Reserve who has come to me to be shipped. I have believed his story and shipped him on probation; and afterwards I found out that he had misconducted himself, and that he had come into the navy to escape punishment, and I immediately sent that man back to his ship. I wish the merchant service to understand that the navy does not want to protect men when they do wrong, but we want to uphold the discipline of the merchant captain, we want to take them by the hand and help them, and then I believe there would be a better understanding between the two services than now exists. Why should not the shipowner have the same discipline on board his ship that the great steam-shipping companies have on board theirs, which are so well regulated? What is it that makes the difference? I speak practically, for I have just come home in the Royal mail steamer "Douro," and the discipline could not be exceeded on board a man-of-war. Naval officers frequently try to get the command of merchantmen when they can get nothing else to do, but shipowners object to a naval officer on the ground that he would be too smart as to discipline. Now, when you go on board these large mail companies' steamers, where they know how things should be done, you would fancy you were on board a man-of-war. The captain is treated with the greatest respect; observations are taken daily, and everything is carried out with the most perfect discipline. I ask why should not that take place in every merchant vessel that goes across the sea? Why should it not, more particularly, in great passenger ships? I do not enter into the question of shipbuilding. Merchants and shipowners may build their ships as they please, they may risk their property; but I maintain that it is a crime that they should play with the lives of their fellow-creatures. You know how some ships are sent to sea. A few people get a little money together; they buy a half-rotten vessel for nothing and send her to sea; if she goes the voyage she makes some money, if she does not, she is insured, and the owners get their money. I think we ought to point out all these cases, and then from them by degrees we shall get at the remedy. We shall not remedy the evil in a moment. We have in this country a Royal Society for the Prevention of Cruelty to Animals; why should there not be a Royal Society for the Protection of Life at Sea. Much is done by societies in this country. We can all work a little, and it is by united efforts that a great effect is produced. I maintain that these are all points connected with the paper, and, therefore, I have ventured to speak upon them.

The CHAIRMAN: Captain Craufurd has given us a very interesting speech, and a great deal of information respecting the special question he has taken up, that is, the want of discipline in the merchant service afloat. I think we have been led into a difficulty by the title of the paper being wider than the paper itself. The title of the paper is "Disasters or Losses at Sea and their Remedy." Many gentlemen have come down here who, having thought over the subject, are prepared to speak on the general question. The paper itself I conceive to be less wide than its title. Mr. Lacon gave us a most interesting account of different disasters, and the address of a learned judge in Scotland; three remedies were suggested by the author of the paper. Strictly speaking, if we confine ourselves to speaking to the paper, I think we should either support the remedies which he has suggested, or oppose them; then, if there should be time, persons may go into the wider part of the question. If any person wishes to address himself to the three remedies proposed by Mr. Lacon, I think that should come first, and then the wider subject afterwards. Therefore I would ask anybody, who wishes to make any observations as regards the remedies of Mr. Lacon, to do so first. Let me read them to you again: "That in all cases there "shall be one registered proprietor or managing owner; that in the loss of life at sea, "evidence of the death should supply the place of the *corpus delicti;* and that some "efficient machinery should be established whereby the common law of the land should "really and truly be brought into operation, for offenders in the words of the Scotch "judges, as quoted in the paper, 'must answer to the law.'" We shall soon know whether anybody here wishes to speak in support of these three remedies, or against them. If not, then I think we shall all agree that the wider subject will be quite open to our discussion.

Captain CRAUFURD: I am not aware that anybody objects, and if there is no objection what are we to discuss?

The CHAIRMAN: If there is none, then we shall go into the wider subject.

MR. GRAY: I think Mr. Lacon put a further proposition to-night.

The CHAIRMAN: Not in the paper. I think we must go by the paper.

Commander COLOMB: I do not quite know whether in what I have to say I shall be in order. I intended to speak strictly to the propositions made by the lecturer for remedying the law; but I find that it is impossible to confine one's-self entirely to that, because we do not appear to have the whole case.

The CHAIRMAN: We do not undertake to keep strictly to the paper; we diverge now to the wider subject.

Captain COLOMB: It appeared to me that the title of the paper would have been better had it been "The Legal Aspect of the Loss of Life at Sea," and had the title of the discussion been "The Legal Remedy," then, I think members would have been able to prepare themselves in some degree for the nature of the paper, because I for one, and some members who sat near me, were rather surprised at the line the paper took, and very much surprised at the limit which was placed on our discussion. I do not mean to say for one moment that the limit was wrongly placed, following upon the paper. On the contrary, I think it was perfectly right that that limit should have been placed, because the great object of these discussions should be, and the great object of the Chairman's duty should always be, to confine members to one or two simple points, because when we can be kept to one or two simple points we are the more likely to produce a definite result. It appeared to me that the legal remedy could be very well divided into two heads—the law, and the means of enforcing the law. The law, I apprehend, includes all rules and regulations which are found conducive to the safety of life at sea, as regards the building, equipping, manning, managing, and navigating our ships. Now, on these points we, in this Institution, are peculiarly well qualified to speak, for we are as it were a jury of experts. We are not shipbuilders; nor are we underwriters; nor are we shipowners. Therefore, we bring to the consideration of the subject none of those prejudices which unavoidably surround men who are placed in these positions; but on the other hand, from the constant connection that we have with the sea, we are enabled to grasp the rights and wrongs of technical questions much better than any other body of men, with the exception of merchant captains themselves; but we should except them as being likely to be prejudiced in one particular direction. As regards this part of the question I say that we are very capable of discussing, and I might almost say of uttering an authoritative voice, on what the law should be; that is to say, on what the rules and regulations necessary for securing the safety of life at sea ought to be. But then we come to the other question—how are those laws to be enforced? That, I take it, is the real gist of the lecturer's paper, how are those laws to be enforced? Now my view is, that we are not so capable of discussing that point, or of judging that point—I do not mean to say that the assistance of men connected with the sea is unnecessary for it; but they can only assist. The main point, the great means of enforcing the laws which have been previously laid down, must be regulated and obtained by the discussion of lawyers and legislators, because they are able to judge of the inflections of different laws bearing upon the point—what laws are likely to produce a proper effect, and what laws are not likely to do so. At the same time, although we cannot speak with authoritative voice, we can by means of the *Journal* of this Institution, let it be known far and wide that we as a body do not pass these points carelessly by; that we are interested in them and that, so far as in us lies, though we may only add a mite to the amount of knowledge that is to be gained on such a subject, still, so far as in us lies, we are determined to let our voice be heard. So far we may go, but we must not expect to produce any great result as regards the means of enforcing the law which may be laid down. We come, then, from these considerations to the questions which have been raised in the paper: "That in all cases there shall be one registered proprietor or "managing owner: that in the loss of life at sea evidence of the death should supply "the place of the *corpus delicti*, and that some efficient machinery should be established

"whereby the common law of the land should really and truly be brought into "operation, for offenders in the words of the Scotch judges, as quoted in the paper, "'must answer to the law.'" Now, I stated at the outset that I did not think we had the whole case before us. I think there must be very few of us who know how far the common law reaches, what it will cover, and what it will not cover.

The CHAIRMAN: In England?

Captain COLOMB: Of England we are speaking.

The CHAIRMAN: We know what it is in Scotland, by the statement here—so many years' penal servitude to the mate, 18 months' imprisonment to the captain. The distinction was drawn between England and Scotland.

Captain COLOMB: The distinction was drawn, but I do not quite understand the lecturer to assert positively that like cases have not occurred in England.

Mr. LACON: I am not aware of any.

The CHAIRMAN: He drew a distinction, and Admiral Halsted alluded to it.

Admiral HALSTED: There is a judicial recognition in the one; in the other there is—what shall I call it—a farcical inquiry.

Mr. LACON: We saw what the law was in the case of the "London," where Sir John Pakington characterised it as a "mockery and a delusion." I brought forward what happened in the three countries, what happened in Scotland, in Ireland, and in England; and I put it to the meeting whether the operation of the law in Scotland is not superior to that of the two other countries.

Captain COLOMB: I will come to that presently. Well, we want to know what the common law of England does cover; that is a point which we had not set before us. It was not pointed out to us; it might have been enough, but it was not distinctly pointed out to us. In the Scotch case, there was a *corpus delicti*. Therefore we are led to suppose that the fact of there being a *corpus delicti* would put the English law in a proper position to deal with the case.

Mr. MOORE: There is the coroner's inquest.

Captain COLOMB: If the finding of a body and holding an inquest on it in England is sufficient to set the common law in motion, to produce the effect which the Scotch law did, why bring us forward the Scotch law at all as an example? I speak in very great ignorance, and with very great diffidence, but it appears to me, so far as I understand what the law of England is, that any machinery which would bring it into effect—and supposing (which is, I think, a perfectly just suggestion), that sufficient evidence should supply the place of the *corpus delicti*—that there are cases where it would be impossible by the common law of England to bring home a charge to those on whose shoulders it ought to rest. In the Scotch case, we had brought home a clear case of neglect on the part of the master and of the second-mate of the ship—careless navigation. That was a point on which almost any jury, hearing the proper evidence, would be capable of judging, in the same way as any jury is supposed to be capable of judging of a case which is wrapped up in medical evidence, where experts are produced to certify the cause of death. So that any jury in England, I imagine, would be able to act as the Scotch jury did, on sufficient evidence of careless navigation being brought before them. But careless navigation covers but a very small part of the whole business—there is such an immensely divided responsibility in what ultimately results in loss of life at sea. There is the building of the ship, the equipping of her, the manning of her, her general management, and lastly, the navigation. The navigation is a part which is the clearest ground, and is most easily dealt with. I can imagine that, supposing a ship, being at anchor in a gale of wind, parted her cable and went on shore, the responsibility of that ship going on shore—supposing that anybody was lost in her—might ultimately rest in the manufacturer of her cable, and upon nobody else. The question is, "Would the common law meet that?" Is it not an absolute necessity to have some statute law? Upon the whole view of the question, it appears a matter to be put before us, whether we are to have entirely common law, or a certain amount of statute law, and how far the statute law is to go. I do not think the statute law is right in proceeding to extreme detail, although the temptation, having once entered upon such a course, is very great. To take a still wider view of the case, it would appear that the question put before us is, "Is Government,

"or rather is the law, to interfere before the loss of life as a preventive, or is it to "interfere after the loss of life, to act backwards upon it, causing those connected with "the merchant service to take the proper precautions?" I think that is one of the widest questions that we can almost have put before us. It involves immense principles. It involves theories of Government, as Professor Huxley put it to the Chairman of the Society of Arts the other night,—"He wished to know whether "the Government was to be a king or a policeman." Now the policeman interferes in both; he not only interferes after the thing has taken place, but he interferes before. It appears to me that by a judicious mixture of preventive measures, and by giving all facilities to the judges and juries of England to grasp the case, as regards the common law, being assisted thereto by well drawn statute law, that then we should get a better result than if we throw over altogether the statute law and the action of the Board of Trade: I cannot think that the action of the Board of Trade, as now held, is altogether wrong. To-day I was looking over some Blue-books, and I was very much struck by some of the first pages I turned to. I found that from 1856 to 1862 there were 9,243 casualties. There were 150 investigations which took place under the Board of Trade; that is to say, those were cases where it was irrespective of the loss of life.

The CHAIRMAN: It was all over the world?

Captain COLOMB: It was all over the world; the casualties took place all over the world.

Mr. GRAY: Was that from the Wreck Register?

Captain COLOMB: Yes, from the Wreck Register.

Mr. GRAY: Then it is only on the coast of the United Kingdom.

Captain COLOMB: Pardon me, there are other cases—there is one of the number certainly that was wrecked on the coast of Syria, another was wrecked on the coast of South America.

Mr. GRAY: There is a little confusion there: the tables relating to wrecks and casualties, relate exclusively to wrecks and casualties on the coast of the United Kingdom; but the part relating to official investigations relates to wherever held, in all parts of the world. The wrecks and casualties relate exclusively to the coast of the United Kingdom, and those 9,000 wrecks and casualties happened on the coast of the United Kingdom.

Captain COLOMB: I am glad to be corrected, but I do not know that it interferes with my argument.

Mr. GRAY: No, it does not.

Captain COLOMB: It modifies it to a certain extent, because the number of casualties out of which these investigations took place, is very much enlarged at once. There were 150 investigations under the Merchant Shipping Act; out of those, there were 79 certificates suspended, the greater part for six and twelve months, only one of them for eighteen months. That is, there were culprits metaphorically hung to the extent of about one per cent. in all the cases of casualties that occurred. I do not think when these things take place, that the action of the Board of Trade can be altogether condemned. I cannot but think that these occurrences taking place, must act as a warning to other men to be very careful. We then come to the question, "Will "acting after the life is lost, be a sufficient guard?" Taking it broadly like that, I should say it is not a sufficient guard; that we want some other protection. The last question on which I have to speak is the question of the inspections. It appears to me that that is one point that the lecturer would insist upon. Now the question of inspection appears to me to involve two issues—Government inspection and Government guarantee. Now those two things appear to me to be very different. I quite think that the Government may very well inspect and come down upon men whose ships are not properly provided, not properly manned, not properly fitted in different ways; but I do not think the Government has the slightest right to issue certificates guaranteeing the efficiency of ships, when, after all, their examinations must be cursory. I think if the Government had the power of coming down at unusual times upon ships, and saying, "We are going to inspect you the "day after to-morrow, and with proper officers examine your ship thoroughly," it should not be said, "You have inspected me before, why do you want to

"do it again." Leave the responsibility upon those men, but keep a watchful eye of supervision, which is in all cases necessary, whatever we may say of it. We find it so in our service, and why not so in the merchant service.

The CHAIRMAN: Mr. Gray, the gentleman who delivered the lecture at the Society of Arts, has expressed a wish to make some more observations in continuation of what he said last night.

Admiral HALSTED: Before the meeting separates I should like to propose a resolution.

The CHAIRMAN: Quite so. Is there any other gentleman who wishes to address the meeting?

Mr. THOMAS MOORE, for several years honorary president of the Seamen's United Society said: If there is no merchant captain in this room, and as I happen to be a representative of that particular class—a class that has been rather abused—I do want to say a few words. I differ in opinion from some of the speakers, but in order not to take up time—a written sermon is always better than one delivered extempore—I have written down what I wish to say, and I can run through it in about five minutes. "The reader of the paper and those who spoke on the question seemed to agree that the Legislature should not meddle unnecessarily with the shipping interest, but none of the speakers have attempted to define where interference should commence or end. The law protects the emigrant, or is intended to do so, by surveys and the enforcement of sanitary regulations. It further endeavours to protect the sailor by insisting upon a certain amount of space in the forecastle for his berthing, free from ship's stores and cables, for the summary enforcement of his claim for wages on the ship, for the serving out of lime juice to prevent scurvy; and flogging has been abolished by the substitution of a scale of fines for the enforcement of subordination and discipline. On the other hand, the owner's rights are cared for in giving magistrates the power of fining and imprisoning seamen for desertion and other offences. Are all these provisions for the government of the merchant service to be repealed? Then the law requires that passenger steamers shall undergo half-yearly inspection, that there shall be two safety valves to the boilers, one placed out of reach of the engineers; that the cables shall be tested, that every sea-going ship shall carry certain regulation lights, and there are rules for the guidance of vessels when approaching each other to prevent collision. Is it intended that all these regulations shall be abolished, or is it proposed that masters, mates, and engineers shall not undergo examination, and that certificates of competency shall be done away with? The panacea for the prevention of ships foundering at sea, going on shore in fogs, or collision is to be looked for, as in the case of newspapers, by making a registered proprietor amenable. There is nothing new in this; all ships have registered owners, and the law is strong enough to reach them. Mr. Scott Russell inveighed against ill conditioned and ill paid masters, and badly laden vessels. There are also ill constructed, ill conditioned ships that are unmanageable in a gale of wind, that will neither wear, stay, nor steer. If it is the master's misfortune to lose ships, he is wonderfully assisted in the action by the naval architect and the builder, or both. Mr. Russell lays a deal of blame on those who stow the cargo, but does not teach us how this is to be remedied. For instance, a ship is placed on the berth, and cargo drops in slowly. It has to be put on board to clear the quays or warehouse. Then lighters are sent alongside, and these have to be discharged. The stevedore is often perplexed, for what should have been at the bottom has frequently to go at the top, for shippers reserve their goods till the last day or two, and then there is a perfect rush. The exigencies of the trade will not always permit of that careful loading which is no doubt necessary; but owners generally endeavour to load their vessels on the best sailing floatage, because they are interested in their ships making fast voyages. That many vessels, however, are overloaded there can be no doubt, though it is difficult to prove this after a ship is lost. As we have been asked to suggest reasons for the loss of life at sea, and to provide safety regulations, this can only be accomplished by subduing the elements, by encountering wind and snow-storms by well-built, well-found, and well-manned ships, and by extending the inquiries into the loss of life at sea by juries, as proposed by Mr. Lacon, even though no corpse shall

be producible. The shipowner and shipbuilder are answerable for a ship's seaworthy condition, but it is quite true that a good ship cannot be safely navigated without a competent crew. This brings me to notice the scarcity of British seamen and its cause. If the master of a ship is to be criminally prosecuted for loss of life, he should be entitled to the assistance of able seamen, and his ship should be well manned. Mr. H. Tracy, some days ago, put a question to the President of the Board of Trade in the House of Commons, which has an important bearing on the supply of seamen for our merchant fleets, and which indirectly affects the manning of the Royal Navy. Mr. Tracy wanted to be informed whether the attention of the Government had been called to the great decrease in the number of apprentices and boys borne by our merchant ships, and also the increased employment of foreign seamen. Mr. Milner Gibson, in answer to Mr. Tracy's inquiries, said that the number of apprentices annually enrolled had varied little during the last six years, being between 5,000 and 6,000 a-year; and as regards foreign seamen, although there was an increase, he could not say whether the proportion of foreign seamen to the whole number of men serving in the mercantile marine was greater than during the last few years, without a careful examination of the returns. The question of the engagement of apprentices was much discussed at the time of the repeal of the law which rendered the taking of apprentices compulsory; and it may be remembered that, in 1854, when the Merchant Shipping Bill was before Parliament, Mr. Horsfall endeavoured to prevail upon Mr. Labouchere to fall in with the views of the majority of shipowners, and the unanimous demand of seamen, and to re-enact a law for the compulsory apprenticeship of boys. The honourable member presented a petition from the Shipowners' Association of Liverpool in favour of the re-imposition of such a clause in the Bill then before the House; but Mr. W. S. Lindsay, another representative of the shipping interest, so strongly objected to any interference with the manning of ships that no action was taken in the matter. At that time there were a considerable number of shipowners in Hull, and also in the north-eastern ports, who favoured the apprenticing of youths; but it was contended, and fairly so, that the shipping interest should be left totally unfettered in this respect. Because the law did not compel an owner to carry indentured apprentices, it did not follow that they were not to be so engaged; and if 5,000 to 6,000 boys, annually, are still apprenticed, it is palpable that the system has not died out, and that owners are free to adopt that course which to them seems best. If, however, full crews of British seamen cannot be procured, and it has become necessary to ship a more than ordinary percentage of foreigners, the question arises how are we to keep up the requisite number of British seamen if this declination goes on? We do not admit, without some official return, that the ratio of English to foreign seamen, on board our merchant ships, is less in number than it was some years ago; still, if there is such a diminution as alleged, it is as well to search for the cause. It is the opinion, we are aware, of a considerable portion of shipowners and mercantile marine officers, that the abolition of the Apprenticeship Act was unwise and uncalled for, and that it has tended to make English seamen scarcer than formerly. On the other hand, the day for restrictions in manning ships has gone by: and if an owner does not wish to be burthened with indentured boys when his vessel is in this country, he ought not to be compelled by Act of Parliament to support and look after them. That there is an immense falling off in apprentices does not admit of doubt; but as the premium to be procured for the shipment of boys is sufficiently tempting to attract agents to advertise for youths, it is possible that were a statistical report made up for 1865, it would be found that the decrease of youths employed in the merchant service is very considerable, but not so great as has been represented. If, however, we go back to a year before the repeal of the law which made the carrying of a given number of apprentices compulsory, we shall find a very great falling off in the comparative numbers mentioned. In 1848, there were 34,858 apprentices in the mercantile marine of the United Kingdom; in 1850, there were 31,636; in 1852, they fell to 14,258; in 1854 to 13,826, and in 1865 to 19,072. In 1848 there were 130,000 seamen on the register, and in 1865 they reached 190,000. Apprentices indentured from 1st January to 31st December, 1846, were by official return 10,376. To keep pace with the growing wants of shipping, the number should be nearer 15,000 than from 5,000 to 6,000. Looking at the increased tonnage of the country, and of

all persons that form the crews of ships and are classed as seamen, it would, perhaps, have been difficult to man our ships, had not the steam tonnage been so largely augmented, and thus bringing into the service so many landsmen as engineers and stokers. In the list of British subjects will be found lascars, free negroes, Anglo-Chinese, and a miscellaneous assortment of Colonials and Asiatics. There never has been, and we suspect there never will be, a complete list furnished of the total number of persons who go to make up the crews of our shipping, distinguishing, masters, mates, able and ordinary seamen, and boys, servants and men in the engine departments, with a classification of their nationalities. An approximate estimate might be prepared, but as one man appears on the muster roll of several ships during the year, he would be counted as many times as he signed articles. If the actual number of seamen of the United Kingdom could be ascertained, apart from other subjects of Her Majesty and foreigners, it would be of some assistance in helping us to form a correct judgment of the number of boys that should be shipped yearly to keep up the supply from which the crews are drawn. If ever seamen were to become scarce in our ports wages would be enhanced, and our owners placed at a disadvantage with foreigners. But, as a rule, the demand creates the supply, but this is also governed by the employment of boys and if these are not taken on, there must be a certain and proximate exhaustion. We must not lose sight of the fact that deaths from natural causes at sea are in excess of those among the shore population. The statistics of the Board of Health in 1849 made this quite apparent. The deaths in the metropolis from zymotic diseases from 15 years old and upwards were 6·7 per cent. of males, and among seamen at sea 61·5 per cent. The deaths at sea were more than double the mortality on land. If we add the losses from wrecks, the retirement of men from old age, accidents, ill-health, and casualties of every nature, we shall see that the present number of apprentices will not fill up the gaps, much less augment the total aggregate. But, as I have before observed, we are not in a position to know whether the falling off in the employment of boys in the merchant service is real or only superficial. It may turn out that if we add the boys other than apprentices to the latter, the numbers are sufficient to recuperate the service. As, however, there is a difference of opinion among shipowners as to the policy or economy of carrying apprentices, the President of the Board of Trade ought to have prepared and laid on the table of the House of Commons, a return of the total number of boys borne on the rolls of merchant ships on a given day, distinguishing those indentured from those shipped for the voyage. There is a growing disposition to have youths trained for the sea service, as is evidenced by the demand for school ships. Still it is questionable whether the means now available are of that magnitude to meet the wants of such an extensive and annually increasing tonnage. There is no lack of boys to be had; the sons of our maritime population take to the sea like ducks to the water, for it is inbred. Our shipmasters, however, like to have youths that have been taught the ropes, and understand the rowing of a boat. We want more schools to give this kind of nautical teaching, and then there may be less cause for sending ships to sea without a boy on board. What owners complain of, however, is that they take youths, teach them their duties, and then, when they begin to be useful, they desert and offer their services to others. Again, there are many owners who do not care about having to look after boys when the ships are in dock. As regards the first objection, it is not so formidable as it has been represented, for whenever a steady and educated youth has been apprenticed he finds it his interest to serve out his time and to gain a certificate of service. The desertion of apprentices is the exception, but not the rule, and the law is strong enough to punish them when caught. If, however, the owner desires further legislative protection it should be afforded to him, and this could easily be done by inflicting a fine on any shipping master who allows any boy who has been to sea to be re-engaged without the production of a certificate of discharge from his last vessel. Further, on the discharge of crews before a shipping master, evidence ought to be afforded—if any youth has been engaged during the progress of a voyage—that such youth was regularly paid off from another ship. Next, as to boarding and lodging apprentices when ships are at home. In all the first-class ports there are Sailors' Homes, and at these model lodging-houses the apprentices can be well cared for. These homes were not in

existence when the old Navigation Act was in force, and therefore there are not the same difficulties experienced now as there were then of providing for apprentices when in port. In the smaller class of ports the boys are usually sent to their friends, and this may be one reason why nearly the whole of the coasting and home trade ships carry apprentices. In Liverpool and London where the ships are of great tonnage, but very few apprentices are taken, and no boys are entered as part of the crew, though the premium business of late years has grown to such an extent that some ships enter, for the voyage only, more young gentlemen as midshipmen than can be comfortably provided for. These youths who have a taste for a seafaring life, get their parents or guardians to pay a premium of £20 to £50 to have them shipped as midshipmen, but those who are in this trade bargain also for supplying outfits. These lads are generally the children of those who can afford, or have afforded to give them a sound practical education. On the return of the ship from the voyage they are discharged, and very often have to pay another premium to be engaged again. Some of them quit the sea service, but a good many make it their profession for life. These are not the sort of boys, however, that are wanted to make able seamen of, for they are after-deck or "gilt button" seamen. The genuine nursery must be supplied by boys who enter before the mast, and not by feather-bed youths. Again, there is a great deal to be learned by a boy in port if he has to attend to the stripping and fitting out of a ship. This the apprenticeship system indirectly provided for. We want, therefore the mercantile marine to be recruited by the infusion of young blood, and then we shall have a better class of seamen, and the complaints urged by the gallant officers in this room, of the inferiority of the crews of British ships, will be rectified. As a maritime state we shall lose caste if the merchant gives the preference to foreign flags because British ships are either undermanned or are sailed with inefficient crews."

Mr. GRAY: I think I ought not to tresspass upon the meeting to-night. But there is one point I should like to correct. Mr. Lacon says, in his paper, that 2,000 lives are annually lost on the coasts of the United Kingdom.* I beg to say that that is an error. The sum does not amount to 1,000. The annual average for the last six years is 815, not 2,000.

Admiral HALSTED: Does that include 1865?

Mr. GRAY: It does not include 1865. The returns for 1865 are not made up yet.

Admiral HALSTED: It includes the returns up to 1864, as I see by the wreck report issued the other day.

Mr. LACON: I made my statement upon an observation made by the gallant Admiral at the Institute of Naval Architects the other day.

Admiral HALSTED: I stated there were upwards of 2,000 wrecks in 1863.

Mr. GRAY: That is so, in one year.

Admiral HALSTED: And I think 1,700 in 1864.

Mr. GRAY: But the average is 1,800 wrecks. As regards another point, I wish to add that Admiral Halsted has entirely overlooked all the efforts of one of the noblest institutions in the world—the Royal National Lifeboat Institution. He has also overlooked the rocket and mortar apparatus, supplied by the Government, and worked by the Coast Guard. During the last six years, 3,000 lives have been saved every year on our coasts. After that I think Admiral Halsted must say that the country has not neglected its duty.

Admiral HALSTED: I remembered them perfectly, and admire them; but they did not come within my specification. I said these wreck charts were put before Parliament, and, for aught I had heard of any national action taken upon them, that they might have gone into the waste-paper basket the next day, of every member who received them. I beg to say with regard to the institutions which you mention, particularly the National Lifeboat Institution, that these are private efforts made to try and rebut the charge that should lie upon the conscience of the country. I might have said a great deal more yesterday with regard to the Board of Trade, but I will not now.

* Mr. Lacon wishes to state that he did not say that 2,000 lives were annually lost on the coasts of the United Kingdom.—ED.

G. HARCOURT, Esq.: I merely rise under your permission, Sir, as one of those who take a very deep interest in this question, and especially the establishment of Sailors' Homes. I should like to ask a question of Mr. Moore. He spoke of the great numbers of those who give a liberal education to their sons, being anxious that they should enter the navy as midshipmen. At the same time he spoke of the paucity of those who offer themselves as apprentices to the merchant service. The question I wish to ask is one that has always appeared to me to be difficult of solution. It is the very great difficulty which those who are interested in obtaining berths for lads desirous of entering the merchant service as apprentices even when educated and well-found, have to undergo to get them into the merchant service. Speaking as one of those who have frequent applications made to me, I may say that if I go to the Registrar-General himself, he has not influence; if I go to the merchant captain himself, he has not power, and often the applicant who comes to us in this way finds it impossible to get into the service, and to gratify that spirit which influences so many of our youths with the wish to go to sea. May I ask why that is?

Mr. MOORE: It is because the owners of foreign going vessels decline to take apprentices for the sufficient reasons that they do not want to keep them; they do not want to keep them when the ship comes home, and is in dock.

Mr. HARCOURT: That is owing to the change in the law?

Mr. MOORE: Yes.

Admiral HALSTED: Before this meeting separates I wish to make a proposition, which, as far as I can see, I hope may have the effect of rendering our two discussions of some practical value. I think we have vindicated in this Institution the deep and heartfelt interest which we feel for our brethren afloat, doing their business upon the great waters. There can be no doubt whatever that each gentleman has endeavoured to put before the meeting such remedies as have occurred to him with a view to meet this disastrous state of things. Whether they be many or whether they be few, whether the remedies have extended over a wide range or are limited to a very narrow one, it is perfectly clear that, if we could here suggest the very remedy of remedies, we have not the slightest power whatever of carrying it into effect; therefore, with regard to these two nights' discussions, although they may satisfy our own consciences, I am perfectly persuaded that every person who has been present at them would deeply desire that some fruit should directly or indirectly arise from them. That is the object and purpose of the resolution which I now propose to the meeting. I have asked no person to second it, because a resolution of this sort, may ultimately come to be worded in a different form from that in which I have put it, and a resolution of this sort, to have any effect whatever, must be unanimous. I will only add that a similar feeling existed the other day at the termination of the session of naval architects. Upon that occasion there was one unanimous feeling that the Council of that Institution—as a body, not as a committee—should be called upon to take the whole subject into consideration, with a view to take such steps as might lead to the best remedial measures which the country is able to propose and carry out. Here we have a perfectly cognate Institution. There is also another cognate institution, I mean the Society of Arts, which has taken up and mooted the question rather largely. Against neither the one nor the other, or against the whole three combined, can there be originated any charge of having been biassed by any interest whatever. But any combined action of the three to operate upon the legislature must be one that should bear upon its countenance the clear and distinct feature of being impartial, and having the view which I have stated. With that preface I will read the resolution, and place it in the hands of the Chairman:—

"That this meeting desires respectfully to submit to the Council of this Institu-
"tion to confer with the Councils of the Society of Arts and of the Institute of
"Naval Architects, with the object of a combined petition to Her Majesty's Govern-
"ment and both Houses of Parliament, praying for a conjoint Committee of Enquiry
"into all matters bearing on the subject of shipwreck, with the view to alleviate, as
"far as practicable, the present annual loss thereby of life and property."

The CHAIRMAN: To be strictly in order this resolution should be seconded.

Captain CRAUFURD: I shall be very happy to second it.

The CHAIRMAN: I think the proper course for me to take will be to put this resolution to the meeting. If the meeting approves of it, then I shall hand it over to the Secretary, to place it in the hands of the Council, and, as a member of the Council, I will endeavour to be present at the next meeting, and do my best to represent the opinions of the gentlemen now present.

The resolution was then put and carried unanimously.

The CHAIRMAN: It is usual at the end of our discussions that the Chairman should sum up the observations that have been made, and express some opinion of his own on the matter. I think this resolution will almost make it unnecessary for me to do much in that way, because it will transfer the matter to the hands of the Council, who will have the whole question brought before them, but I should like to make one or two observations. I listened with great pleasure to the remarks made by Mr. Moore, who spoke from personal experience in the command of a ship, and I agree with every word he uttered, for we hold exactly the same views, particularly on the question of the apprenticeship of boys. I went into the calculations a few days ago, and I made out that to recruit the merchant service sufficiently, it would require 16,000 boys every year, and, as he says, only 6,000 are forthcoming, I am confident myself that our merchant service is dying down, as far as the seamen are concerned. It may be said you have got engineers and stokers instead of seamen, but the deterioration is in quality as well as quantity—the merchant service requires 180,000 *bonâ fide* seamen, in addition to the engineers and stokers. There is but one cry from all our brother officers, viz., that the seamen of the merchant service are deteriorating rapidly. Shipowners admit it. I have talked in every port nearly in England with them on the subject. When you get a shipowner to talk it quietly over with you he tells you that he wishes there was an apprenticeship-law to-morrow, and that he wishes he was forced to take apprentices, but he will not take them now because his neighbours in the next street will not do so, and he knows that if of his own accord he takes an apprentice, he may, at considerable expense and inconvenience, be only making a seaman for his neighbour in the next street, therefore he will not do it. Captain Colomb has shown that there are three views possible on this question. Some gentlemen advocate inspection, and nothing but inspection, and do not propose to carry out the law any further; others lay stress on increasing the legal action and sweeping away inspection. I think Captain Colomb has hit the proper mean, which is, 1st, to keep up inspection, watch the ships carefully, and register their condition when they go to sea, taking care that we do not go too much into detail, but to give no certificate; and, 2nd, to strengthen the law at the same time, in the manner pointed out by Mr. Lacon. I am sure I shall carry all of you with me in giving your thanks to the lecturer for the very interesting paper which he read to us last night.

Mr. LACON: Will you allow me to explain to Captain Colomb that I was quite aware of the great questions that are involved in the legal consideration of the remedy proposed by me, and, therefore, it had nothing at all to do with the paper. It was forced from me in order to raise an issue. I stated this distinctly as a private individual that it may go forth as the opinion of a private individual along with the paper. I am no lawyer, still I have raised the question simply for discussion. I am glad the Chairman has not confined the discussion because he has thus been the means of eliciting most valuable information.

Since the meeting, a request has been made by Rear-Admiral Halsted, the proposer, and by Captain Craufurd, R.N., the seconder of the resolution, to Rear-Admiral Sir John D. Hay, Bart., M.P., F.R.S., the Chairman of the Council of the Royal United Service Institution, that the names of the Council of the Royal National Lifeboat Institution for the Preservation of Life from Shipwreck, and the Council of the Shipwrecked Fisherman's and Mariner's Royal Benevolent Society, may be added to the resolution.—ED.

APPENDIX.

No. 1.

H.M.S. "Egmont,"
Rio Janeiro, 6 April, 1864.

Sir,

I deem it my duty to forward the enclosed copies of letters between myself and Dr. Hughes and Mr. , master of the Government emigration ship " ," as it would appear that this ship must have left England in a very unprepared state to undertake the long voyage she was bound upon, and that her former master was a person quite incapable of undertaking such a serious charge.

This ship put into this port in consequence of a serious mutiny of her crew. A report of proceedings, instituted in consequence, has already been forwarded to the Board of Trade.

Subsequently I found her so disorganized as to be obliged to take measures to place her in a proper condition to perform the remainder of her long voyage, after personally inspecting her, and making due inquiries.

Mr. , the late master, seemed to be totally unfit for his charge. No account could be obtained of remains of stores on board, and he admitted having brought two apprentices without authority or permission from England, and seemed altogether adrift about his ship. The coals supplied for the condensing engine were so badly stowed as to necessitate a fresh supply here. To avoid delay during the unhealthy season at which she happened to call here, my object naturally was to expedite her departure, and I took every means in my power to forward it.

Much praise is due to Dr. Hughes for his zeal in the interest of the emigrants under his charge, and the able assistance given by his constabulary on the sad occasion of the crew's mutinizing.

This case appears to me to be a very grave one, and I, therefore, write this letter in the hope that it may assist the Emigration Commissioners in preventing a recurrence of such very lamentable circumstances, as they can never add to or reflect credit on them, or promote the welfare of emigrants under Government supervision.

Circumstances have prevented my sending this report sooner.

I am, Sir,
Your obedient servant,
Fred. A. B. Craufurd,
Captain and Senior Officer.

The Secretary of the
Emigration Board, London.

No. 2.

Port of Rio de Janeiro,
Feb. 19th, 1864.
Government Emigration Ship " "
(from Southampton, 4th Dec., 1863)
bound to Brisbane, Queensland.

Sir,

Arriving here on the 9th instant in charge of emigrants on board above ship, I immediately put myself in communication with the British Consul, agreeably to instructions received from Her Majesty's Emigration Commissioners, "should the "vessel be forced from any cause to put into a foreign port."

In my letter to the British Consul I gave an inkling of some circumstances of a grave nature, that had occurred on the passage hither, and also of the immediate cause of the ship having to put in here; the uncertainty of the safe transit of my letter (given for delivery in charge of a Brazilian Customs' officer) prevented me detailing more fully many matters that I considered of importance, which subsequently, when opportunity offered, I verbally communicated, partly to the British Consul, but more fully to yourself, and which I now desire to record on paper, viz., that owing to the absence of discipline amongst ship's company generally, the difficulty of dis-

charging my duties was considerably enhanced. That this absence of discipline was due to Mr. (the late master's) puerile conduct with boys of crew, of whom there were a larger number than allowed by charter party, some not being on ship's articles, and also his familiarity with them and the seamen generally. That as he, Mr. , had not caused his storekeeper to keep such an account of "broachings" as would show what amount of stores remained in hand by the number of packages opened, although both parties were repeatedly reminded and cautioned by me of the necessity of doing so, and as the stores were not originally, "properly and conveniently stowed," the exact quantity now remaining could not be ascertained, also some things either not on board or inaccessible. That eight or more persons were messed at or fed from cabin table, although found for five persons only. Finally, that Mr. displayed a great want of firmness in dealing with his crew when in a state of mutiny.

For the foregoing reasons I represented the necessity of removing the master Mr. (if he did not resign).

The having additional provisions shipped; the overhauling of plummer work which was out of order; also the ship, her apparel and furniture generally, as she leaked, and some remarks dropped by Mr. in reference to latter, I thought prudent to acquaint you with.

In conclusion I have to express my thanks to you and Lieut. Curtis, H.M.S. "Egmont," for the attention paid to my representations, and the alacrity with which you have proceeded for the dispatch of the ship " " in an efficient condition on her voyage.

I have the honour to be, Sir,
Your obedient servant,
J. SHERIDAN HUGHES, M.D.,
Surgeon Superintendent.

To Captain F. A. B. Craufurd,
H.M.S. "Egmont."

(*The following explanatory communication has been forwarded for insertion since the reading of the original paper.*—ED.):—

THE object of my paper has been to show, that between the action of the Board of Trade (**the London**),——not getting up the evidence in Ireland (**the Queen Victoria**)——"Crowner's 'quest law" in England (**the Tonning**),——a verdict of manslaughter against the Board of Trade (**the Times**),——and the absence of the *corpus delicti*, the matter seldom gets to our Superior Courts, and that when it does, there is a wide discrepancy between the administration of the Law of England and Scotland.

IN ENGLAND—

In the paper read at the Society of Arts, it is stated that on the 27th of August, 1847, the boiler of the "Cricket" (halfpenny steamer) exploded, resulting in the loss of six killed and twelve wounded. The engines had become leaky in the trunnions, the master and owner complained to the engineer of the loss of speed, and the engineer tied down the safety valve. A witness on the inquest stated that the engineer "tied the end of the lever down by two pieces of spun yarn to two spike nails which were driven into a beam athwart the vessel,"

and that he (the witness) was dismissed from the service, because he made such an "oration" one Sunday, when the engineer, who was drunk, had got the safety valves fast, and the pressure was so heavy that the water was rising with the mercury in the pressure guage. The case was tried, and on being convicted, the Lord Chief Justice Denman, after commenting with severity upon the fearful consequence of such proceeding, sentenced the engineer, to "two months' imprisonment without hard labour."

In Scotland—

Direction to Jury. That when the Crown had proved an accident by loss of life in a vessel under panel's command, it lay on them to prove their innocence of all blame.

"Intention to do wrong," said the Judge, "was not part of the crime of culpable homicide; if intention was proved under such a charge, it would amount to murder. The crime of culpable homicide was committed whenever a person unintentionally committed an act, whereby the life of another was lost, or where he failed to perform his duty when charged with the preservation of life, without having sufficient excuse for such neglect, and life was lost in consequence.

"Any person placed in a situation in which his acts may affect the safety of others, must take all precautions to guard against the risk to them arising from what he is doing.

"Men became accustomed to perils, and daily became more and more daring and rash in the exercise of their avocations; and it was surely no answer, when at length the danger which had been so often run, resulted in the death of some ——— beings, to urge that hundreds daily before had been in danger by a course of like reckless conduct.

"That he did err in judgment, was undoubted. Had his conduct been intentional to produce the disaster which occurred, his crime would have been that of murder.

"If the verdict had included in it recklessness on his part, of course there could have been no other sentence than one of transportation."

WM. STIRLING LACON.

May 22nd, 1866.

Evening Meeting.

Monday, February 19th, 1866.

W. STIRLING LACON, Esq., in the Chair.

NAMES of MEMBERS who joined the Institution between the 5th and 19th February, 1866.

LIFE.

Cadman, W. E., Capt. 5th W. York Mil. 9*l.*

Fordyce, C. F., Colonel, Unattached. 9*l.*

ANNUAL.

Graham, C. S., Lieut., R.A. 1*l.*

Miller, G. M., Major, 79th Highlanders. 1*l.*

Fosbery, Geo. (V. C.), Capt., H. M. B. Army. 1*l.*

Black, W. T., Staff-Surgeon.

Lewis, F. W., Lieut., R.N. 1*l.*

ffolliott, P. H., Lieut., 99th Regt. 1*l.*

Purcell, Geo. J. G., Lieut., R. N. 1*l.*

Robertson, Wm. B., Lieut., C. M. Riflemen. 1*l.*

ADDITIONAL PARTICULARS RELATIVE TO HIS METHODS OF WORKING HEAVY GUNS,—BEING A SEQUEL TO HIS PAPER READ ON THE 15TH FEBRUARY, 1864.*

By H. D. CUNNINGHAM, Esq.

IN the paper which I had the honour of reading before the members of this Institution in 1864, I mentioned that I had many other inventions relating to the working of heavy guns, which time would not allow me to include in that paper. I have now to thank the Council for permitting me to resume the subject, amplified as it will be by the results

* *Vide* journal, vol. viii, p. 67.—ED.

of the continued pursuit of it, and by the observations which I have been enabled to make on the practical working of heavy guns on broadsides, through the kindness of Captain Cooper Key, C.B., who has permitted me frequently to witness the exercise and practice of the 12-inch gun on board of the "Excellent," and subsequently on board the "Minotaur" in her late trials in the channel.

In my last paper I only described one form proposed by me for applying steam power to the working of heavy guns, for at that time I was under the impression that modern heavy guns could only be worked at sea by the superior power of steam; I cannot exactly say that my views have been altogether altered in this respect; for I still believe the enduring and untiring nature of steam power to be superior to manual strength, subject as that is to so many disadvantageous influences to which the steam-engine is insensible. Still I am bound to confess that more has been done in the working of heavy guns by manual power aided by mechanical appliances than I then contemplated could be done.

I may observe that the plans described by me in my last paper were the subjects of a patent granted to me in October, 1862, and as the descriptions contained therein are precise, I trust I may be forgiven if I occasionally quote from the specification of that patent in order to aid me in my present descriptions. The form of applying steam power for working guns before described by me, consisted in the employment of winches or windlasses placed at the ship's side and turned round by steam power, and to which the side and train tackles were taken as required. Another form, however, in my patent consists in the employment of an endless chain for transmitting the power or motion to the gun carriage. Upon the spindle, or shaft, turned round by the steam power, I fix a wheel, furnished with indented teeth or cogs, to lay hold of the chain which is passed round it; for the purpose of protecting this wheel as much as possible from shot, I place it on the deck below; the endless chain is led up through the axis of the slide (made hollow for the purpose) and over rollers, and then along the slide and over a roller in the rear of it. I describe two methods of using the power and motion transmitted by the endless chain. One is by fixing winches or windlasses on the axis, which carries the roller at the rear of the slide, and by taking the various tackles to those windlasses for the production of the required motions for running in or out or traversing the gun; and the other is by leading the chain through slots in the rear chock of the carriage, and using nippers to nip or grasp the chain to the carriage, so that the gun may be carried along by the chain in whatever direction required—either to run it in or out—by releasing the nippers the gun is free to run in clear of the chain when fired. Using the words of my specification:—

"The bands, ropes, or chains (endless) thus revolving along the "slide will have motion in two directions, viz., towards the centre of "the ship and towards the outside of the ship; and it is these two "opposite motions which I employ to run the gun in and out. This "is effected by suitable compressors being attached to the carriage "and arranged so as to compress or grasp the chain, band, or rope,

" and thus the required motion is conveyed to the gun-carriage in the " direction taken by the chain so grasped."

Here then you see what I believe to be the first record of an endless chain being employed for running a gun in and out, and I again further illustrate it (See Fig. 1, Plate x). N is the cogged wheel fixed upon a shaft supposed to be turned by steam power, and for the purpose of protection from shot placed down in the orlop. M M M is the endless chain passing over an adjusting roller at Q, then up through the gun-deck and over the rollers B C, then along the slide and over the wheel S. This illustration is extracted from the specification of my patent.

Although I describe steam as my motive power, I must observe that in my specification I do not confine myself to that force for revolving the endless chain. The expression used by me in my patent is, " By steam or other mechanical power."

Tenaciously as it may appear that I cling to my theory of employing steam power to the working of heavy guns, when I became aware that the Admiralty had evidently formed views in favour of retaining the manual power, but with the admission of mechanical appliance to supplement the physical force, I directed my attention to the consideration of methods for applying mechanical assistance in the most simple form possible for training and working heavy guns, and I believe I have produced methods for accomplishing these objects which have quite answered the purpose, and which possess the strong recommendation of great simplicity.

I will first of all describe my training gear. In June last I was permitted to go out in the " Minotaur " to see the working of applications for traversing the 12-ton gun, consisting of winches on each side of the gun placed towards the ship's side, to which the train ropes were taken; indeed, similar to the plan described in my last paper for working guns by steam, with this difference—that manual power was applied to rotate the winches instead of steam power, and the winches were on the fighting deck instead of below. Although so far satisfactory, still the necessity which existed for the men on one winch to slacken whilst the others hove round, and *vice versâ*, made it appear to me that if it were possible to produce some appliance by which *one* action should convey the reciprocating motion to the gun, it would be far better. Accordingly, after much reflection on the subject, it occurred to me that the instrument used by me for bracing round ship's yards might be employed with good effect for traversing the guns. This instrument consists of a kind of winch or crab, having a grooved barrel furnished with teeth or cogs to lay hold of the chain. Indeed, similar to Brown's capstan, or to the boss applied by me on yards for reefing topsails from the deck. The chain, after passing under rollers at the extremes of the bed plate of the winch, is led over the barrel, and so in whichever direction the barrel is turned round, the chain is dragged in on one side, and passed out on the other. Figure 2, Plate xiii, represents a side view of a machine of this description. At the points where the chain comes from under the rollers, lever stoppers are applied to nip or secure the chain when

Mr. Cunningham's System of working heavy Guns.

Fig. 1.

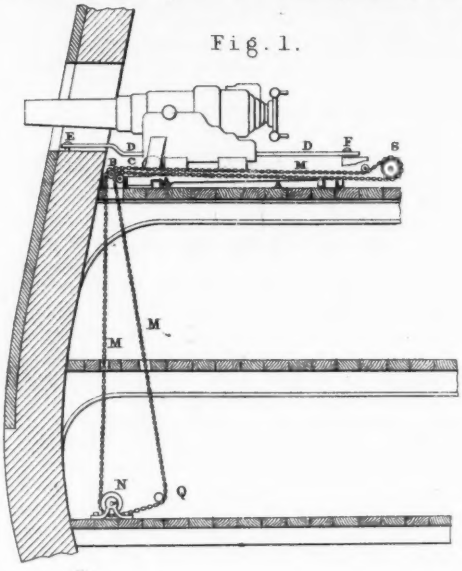
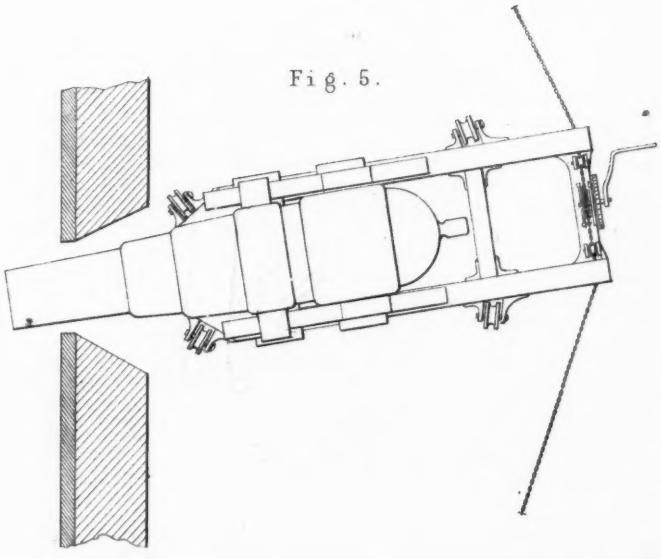


Fig. 5.



Mr. Cunningham's System of working heavy Guns.

Fig. 4.

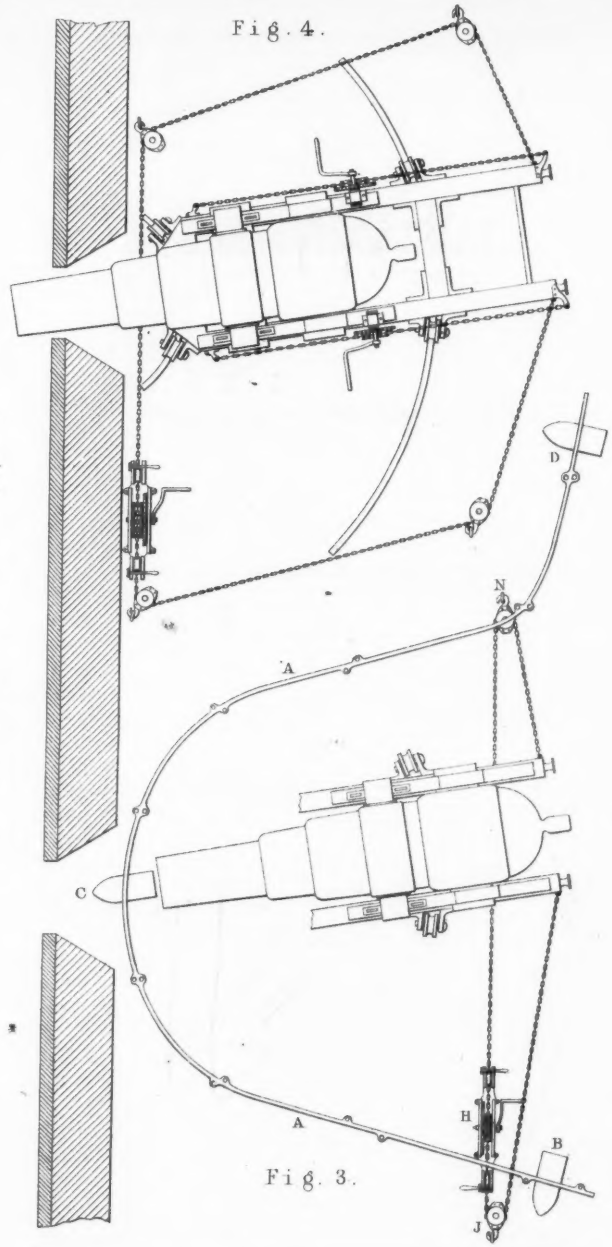


Fig. 3.

J.Jobbins.

Mr Cunningham's System of working heavy Guns.

Fig. 6.

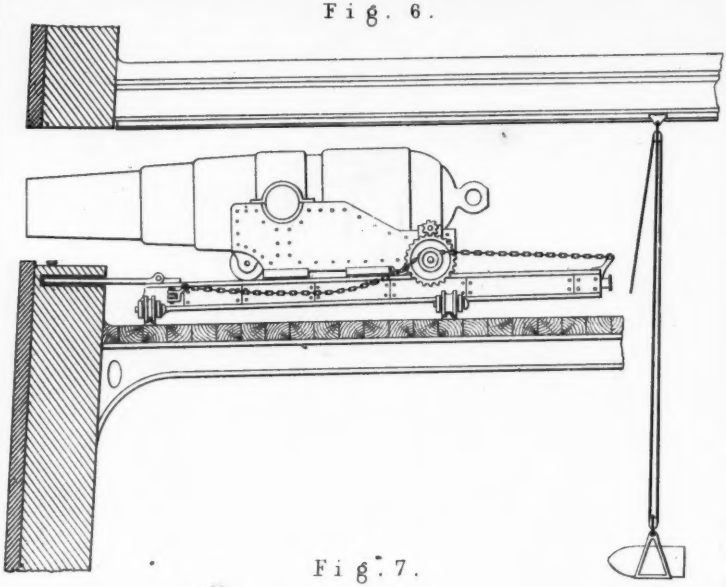
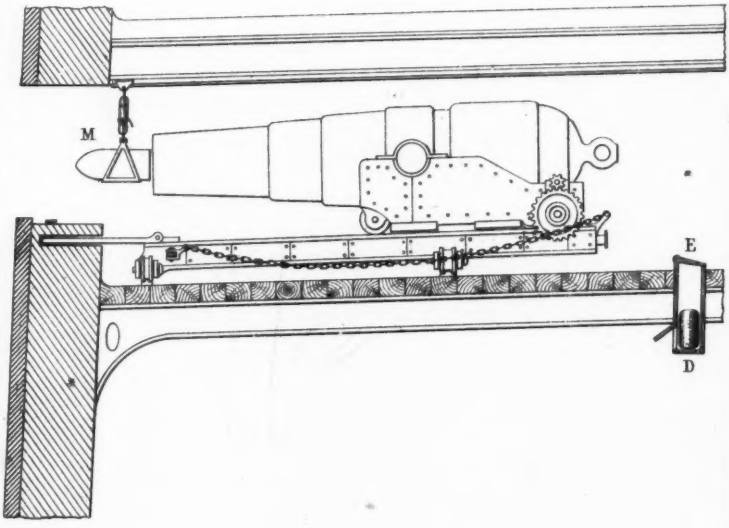


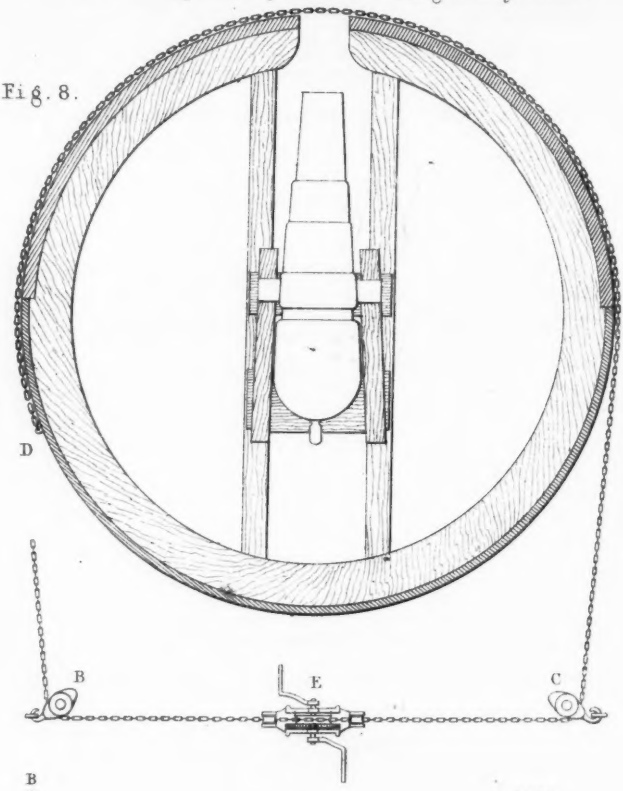
Fig. 7.



J.Jobbins.

Mr. Cunningham's System of working heavy Guns.

Fig. 8.



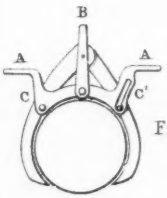


Fig. 10.

Fig. 2.

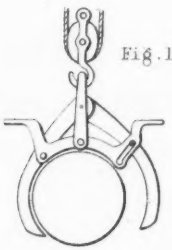
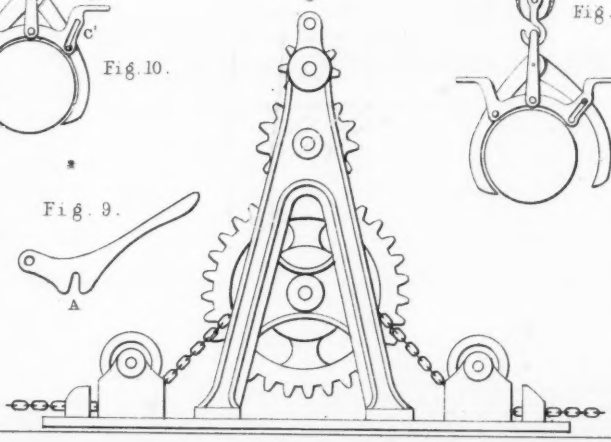


Fig. 11.

Fig. 9.



J. Jobbins

required to secure the gun. Figure 9 represents this lever stopper The forked slot at A goes over the vertical link, and prevents the next horizontal link from passing.* Here was at once a mechanical action admirably adapted for the production of reciprocatory curvilinear motion to the gun. Having obtained permission of the Admiralty I fitted my plan to the 12-ton gun on board of the "Excellent," and the result was most satisfactory. It was shown that two men could easily transverse the gun from extremes of right and left in nine seconds. Indeed, where the machine was first placed, a boy of 14 years old actually moved the gun round with ease. This first position was as represented at H, figure 3. At N a screw bolt was put into the deck, to which a leading iron block was hooked. At J another screw bolt was fixed, to which another leading block was hooked. The ends of the chain, after passing through these blocks, were secured to the slide on each side. It will be seen that when the chain on one side of the slide is pulled upon by the action of the machine and slackened upon the other, the slide is necessarily dragged round. It was subsequently imposed upon me that the machine should be placed close into the ship's side, which was accordingly done, as represented in figure 4. In this arrangement four leading blocks are used. The same action, nevertheless, is obtained, although probably with some loss of power by increased friction. It does not, however, appear to be of much moment, as the machine really worked very well in this position, and it has continued to give satisfaction. It is only a few days ago that I was on board the "Excellent," when I received loud commendations on the working of my machine. This is the position also of the training gear on board the "Minotaur." It certainly occupies a space which is not available for any other purpose, and the winch men are protected from shot entering the port. Moreover, it is favourable for them to see the captain of the gun, and to receive his command in training both by voice and gesticulation. I am anxious to call attention to the extreme facility of application of my training gear. The winch is simply secured to the deck by six screw bolts, and, with the bolts for the leading blocks, complete the fittings. The training gear on board the "Excellent" was actually fitted, and the gun traversed by it in less than one hour; and this facility of application must be accepted as a great recommendation, as in the event of a gun being shifted to another port or to another ship, the training gear can readily go with the gun, and be in working order before, or as soon, as the gun is got into position, which impromptu movement cannot be accomplished when preparations of a structural character have to be entered into.

Another form of my training gear appears in figure 5. Here I place my training appliance on the rear of the slide, and the ends of the chain are secured to the deck. I consider this a very simple and efficient mode of training, and well adapted to guns on batteries exposed to weather, as the gear can be readily taken off and applied, and

* These lever stoppers give great controlling power over the gun in heavy weather. —H. D. C.

thus kept in working order without difficulty. Before closing the subject of training appliances, I may observe, that in my patent I describe plans for transmitting the motion from the winch at the ship's side to the gun *under the deck*. I am, however, strongly impressed with the superior adventure of having all the fittings *in sight* and capable of being readily shifted in case of need.

I will now proceed to the running in and out of guns. Some years ago when I first entered into this subject, I considered that the running *out* of a very heavy gun would be a considerable difficulty. I contemplated also that powerful means for running *in* would be required, although this in actual practice would be provided for, as the gun when fired of course would run in of itself. But for exercise without firing, &c., it would be necessary to run the gun in by mechanical assistance. These considerations, however, went through some change, when it was determined to have the rear end of the slide higher than the outer end. The difficulty of running *out* was then removed, but that of running *in* was greatly increased, as, in the first instance, the gun would run out by its own gravitation; but to run it *in* became a formidable operation. I saw then that here was a field to work upon. It was clear that the ordinary means for running the gun in by means of the train-tackle were totally inadequate when dealing with a 12-ton gun. It took twenty-four men to run the gun in, and that too with difficulty and loss of time, indeed rendering ordinary exercise almost impossible. The declination of the slide also creates some difficulty in respect to the gun running in to its full extent when firing. It frequently occurs that from the ship's giving a roll just at the moment the gun is fired, or from the compressor, or being extra taut, the gun will not come in sufficiently far for loading. The necessity then for some powerful mechanical appliance which could be promptly applied to run the gun in was apparent. Without taking upon myself to describe what has been done by others to meet these requirements, I will describe what I have myself produced for running in heavy guns. Acting under the deepest conviction, that whatever was done in this respect, the means should be of the simplest possible mechanical form; that they should admit of being easily applied and as easily taken off; that they should be of such a character as not to be injured by salt water, or the various casualties to which a ship's gun is liable; and that the whole should admit of an ordinary armourer making good any defect. To sum up all, it appeared to me to be most desirable to have everything *in sight*, and, moreover, that the appliances should not be too mechanical; that is, not to provide mechanism to do that which the men standing about the gun could accomplish; but only to confine the mechanism to the actual production, or rather, multiplication of power. Here then were the conditions I imposed upon myself, and to which I may add that the gun was to be run in by four men in twenty seconds. Now, in carrying out all this, I am sure when I explain my method to you by the aid of these diagrams and models you will acknowledge that I have been very successful. The large model is a full sized one of the bracket or side of an iron carriage for a 300-pounder with its slide. The running-in gear, you will

observe, consists of a pinion and power-wheel carried upon a block which is attached to the rear end of the carriage by two simple drop bolts. Attached to the power wheel is a grooved barrel or boss furnished with indented cogs, or teeth which lay hold of the links of a chain extending along and attached to each end of the slide, and which chain can be easily lifted off from and on to the boss by the men. A crank handle is applied to the axle which carries the pinion, and so in whichever direction the boss is turned round the carriage is dragged along the slide by the side chains. When the gun is fired, the chains are lifted off the bosses and the gun is then free to run in. You will also be able to follow my description by these diagrams. Figure 6, Plate xii, represents the chain in gear and the gun supposed to be running in. Figure 7 shows the chain thrown off the boss, thus allowing the gun to be driven in by recoil free of the chain. Figure 4, Plate xi, represents a ground-plan of the arrangements. And now as regards the results of the practical working of my gear. The appliances were fitted to the Admiralty pattern wooden carriage and slide carrying the 12½-ton gun. The use of this carriage was by no means favourable to my gear as the gun comes in much heavier on the wooden slide than on the iron one, yet it was found that four men could easily run the gun up the slide in fifteen seconds; and, indeed, it has been done by two men; and with an iron slide I have no doubt that it could be always run in by two men. On one of the cruizes of the "Minotaur," the gun being to leeward, it frequently stopped in running in, the chain was then promptly lifted into gear by Nos. 9 and 10, the winch handles shipped, and the gun run in to its full extent, without any delay in the loading of the gun. In consequence of the gear not having been placed sufficiently far upon the carriage, and the slide being too short, the breechings also being over slack, the power-wheels were struck several times with great force against the stanchions on the slide, and twice were broken, yet the armourer who had been only temporarily shifted over from the "Royal Sovereign," and had only a few simple tools with him, in both cases shifted the wheels and made good the damage in a few minutes. Indeed it has been practically proved that the whole of the gear can be taken off the carriage and slide and replaced in less than one minute—a shorter time than it takes to shift a breeching. For running out, the gear certainly possesses a controlling power which is recommendatory. For example, the gun can be run out, or rather allowed to run out by itself in less than five seconds, whereas it cannot be run out with my gear in less than ten seconds. While the "Minotaur" was alongside the dockyard, the gear was taken off the carriage for some purpose, and was laying for two days in the scuppers, and when discovered by me was under a heap of wet swabs, yet it suffered no injury whatever. Indeed, I am sure you will agree with me, that nothing could be more simple or more suitable to bear all the rough work and exposure to which everything about a ship's gun is liable, than the gear provided by me for working the gun, and which is now before you. It possibly may appear, at first sight, that the power-wheel is large. Yet it must be borne in mind, that fourteen tons is a great weight to drag up an in-

clined plane of three inches in twelve feet, and which inclination, too, is subjected to an increased power by the heeling over of the ship, and it was therefore necessary to provide ample power and, at the same time, secure a proper speed in the passage of the gun; and in this, I flatter myself, I have been successful. It was shown on board the "Minotaur," that in quick firing very nearly two rounds a minute could be accomplished. To keep pace, therefore, with this, I estimated that the means for running in should be qualified to do the work at not less than the rate of *fifteen seconds* per six feet. A slower rate than this might impede the working of the gun. My gear is admirably adapted to iron carriages from having the holes for the drop bolts of uniform sizes and distances, the gear could be readily shifted to other carriages in less than one minute. This facility of application also suggests the suitability of my plan for battery guns, about which it is desirable to have working gear that can be easily taken off and on, as everything attached to guns of this description suffer so much from exposure to the weather.*

I will now sum up the qualifications of my running in and out gear and my training gear.

A 12½-ton gun has been run in to a taut breeching by four men in 15 seconds.

A 12½-ton gun has been run out by two men in 10 seconds.

A 12½-ton gun has been traversed extreme over say 56 degrees by two men in 9 seconds.

The running-in gear can be taken off the carriage, and also the slide, and replaced in less than 1 minute.

The running-in gear was manufactured and applied to the gun in less than one week.

The training gear was fitted and the gun traversed by it in less than one hour.

I will next proceed to the service of the powder and shot. I think that the importance of this department can scarcely be over-estimated. In cricket much of the success of the game depends on the skill and alacrity of the fielders, and this metaphor may be applied to the provisions for supplying powder and shot. Perfect as all immediately about the guns may be, and excellent as the guns themselves may be, still if anything be wanting in the service of the powder and shot, how much of the efficiency of the gun may be impaired.

I cannot contemplate the passage of ponderous shot about the decks in heavy weather without the impression that other provisions than those now existing are required. The size of modern cartridges must be a subject of anxiety. It is not in their case so much a consideration of weight, although even here there is a great weight to deal with, as the cartridge of a 300-pounder with its box is not far short of half a hundred weight; and should we really have

* Whilst this paper was being prepared I received orders to apply my training gun to the 600-pounder, a 22-ton gun to be placed at South Sea Castle Batteries.—H. D. C.

22-ton guns in future armaments, then we shall have cartridges of at least a hundred weight.

But it appears to me that great danger may be apprehended from the passage along and the existence of such large quantities of powder on the fighting deck in action, liable as the cartridges are to be broken and their contents scattered about. It will be then to consider how far it may be desirable to provide means for reducing the passage of cartridges along the decks to the smallest possible limits, and also the interval between the production of the cartridge and its deposit in the gun.

In the first of these provisions I propose to convey the projectile direct from the hatchway or shot-rack to the gun by means of what I denominate my curved over-head railway. I propose to attach to the beams over-head a rail formed of two-angle irons placed together in the manner shown in figure 3, Plate xi (here I also exhibit a portion of an actual railway), by which it will be seen the flanges on each side form a railway, and upon that way I adapt a carriage furnished with rollers, which enable it to travel freely upon the rail; from this carriage the projectile is suspended; the curve is so adapted as to sweep round the front of the gun, as illustrated by A A, figure 3. Supposing the projectile to be lifted at B, it can be transported along the rail until it comes to the muzzle, as seen at C, and seen again in figure 7, Plate xii, at M, when it can be easily deposited in the gun, and the carriage taken back again, or passed round the other side, as may be found most desirable in practice. I propose that the rails should be extended along the deck, and be so made to correspond as to enable shot to be conveyed from distant parts of the decks. The projectile D, figure 3, is represented as travelling along the rail extended in this manner. I believe that arrangements of this description will greatly facilitate the service of the shot by providing a ready and easy method of conveying the heavy projectile direct to the gun.

As regards the cartridge, I propose to have towards the rear of the gun, in a suitable position, a handing scuttle or recess, fitted with a carefully closed top—say a metal flap with leather lining, similar to a side scuttle. I propose to have the sides of the handing scuttle raised above the deck, and higher towards the gun. A box or recess for the cartridge to be fitted underneath the deck, with a door opening into and from the deck below, and through which the cartridge is placed in the recess ready to be taken out for the service of the gun. By this arrangement the service of the powder will be entirely conducted underneath the fighting deck. There will be no carrying about of powder along the deck, to the great risk of its being scattered by a shot or splinters striking the powder-box, and the cartridge will be only taken out of the recess at the moment it is required to be used. The figure E in the rear of the gun, figure 7, illustrates this description. The cartridge D, has been placed in its recess through the flap door, which opens from the lower deck, and upon opening the flap cover on the fighting deck the cartridge is at once obtained.* The

* Vice-Admiral Sir Peter Richards, in inspecting the models in the Institution,

handling of the projectile, or, in other words, the picking it up, has been also a subject of consideration with me. I am not satisfied with the means I have yet seen for this object. In regard to a cradle-like shot-holder, it appears to me that not only time and trouble are expended in putting the projectile into it, but also if the shot be furnished with studs there must be difficulty in launching it off from the cradle. The grummet-sling is better and very simple; but still with it time is lost in putting the shot into it, and adjusting the grummet. I now call your attention to the instrument (figures 10–11, Plate xiii) which I have designed for *picking* up the shot. You will see that it is a kind of tongs, which open out and then close upon the projectile; and when the weight is brought upon the suspensors, the moveable arms are tightly kept together and firmly grasp the shot, which is so adjusted in the holder that the end can be placed at once in the gun. Half the weight of the projectile is thus taken off, and the other end can be easily supported by hand; and directly the weight is thus relieved from the holder, the shot is released from its hold. Figure 10 shows the shot-lifter clasped over a projectile. C C′ is a moveable bar furnished at C′ with a socket lock, adjusted to fall into a stud stop on the moveable leg of the shot-lifter. The shot can be lifted by the handles A A, or by a block hooked to the radius bar B, as seen in figure 11. In whichever mode the shot may be lifted the action of the weight on the bar C C′, and also on the moveable leg of the lifter, is to lock the lifter together firmly. Figure 11 shows the moveable leg released from the stop socket, and opened to receive the projectile. The action of this shot-lifter is very satisfactory.

I imagine this provision for transporting the shot will greatly facilitate this service.* Before closing this description I must call attention to the action of the radius bar to which the block is hooked, as in figure 11. It will be seen its suspensory axis is on the cross bar, and close to the projectile. This enables the projectile to be turned round so as to accommodate the studs to the grooves of the rifling.

In my Patent of October, 1862, I describe a more simple and inexpensive method for turning round guns mounted on the turnable principle than the costly cogged circles, and I believe my endless chain machine could be used advantageously for that purpose. I propose to pass the chain round the base of the turret in opposite directions, the ends being secured to fixed points; now upon the chain being drawn in upon one side by the machine, and slacked out upon

suggested that a line with a hook on the end of it be used for lifting the cartridge out of the recess, a flannel or tape becket being worked in the end of the cartridge to hook on to, and a score in the edge of the recess for the line to lay in. The man placing the cartridge in the recess from below would hook the line on ready for use. There is no doubt this would facilitate the operation.—H. D. C.

* Since this paper was written, my shot-lifter has been tested on board the "Excellent," and projectiles ranging from 9-inch to 7-inch successfully picked up and carried by it. The operation of grasping the shot and lifting it being almost instantaneous.—H. D. C.

the others, the turret will be necessarily turned round. The lever stopper can be applied in a moment to stop and control the turret. Diagram 8 is an illustration of this. E is the training machine. The chain is seen to be led through the blocks B, C, the part going through C being taken round the turret to the fixed point at D. (This part of the chain is only shown for the purpose of clearness.) It will be seen that when the machine is turned round it must drag the turret round with it, winding up the chain on the other side. This action is seen in the model now exhibited.

And now, before closing this paper, I must express how much impressed I feel with the importance of the subject of it. I believe it to be at this time a national one of the deepest moment. Without going into the question whether heavy guns can be worked better in turrets than in broadsides, I simply deal with the fact that we have many costly broadside ships already constructed, and, I believe, have many more in course of construction, and probably shall go on building broadside ships; and if it be an accepted theory that guns of large calibre, and consequently of ponderous weights, are to form the armaments of these ships, then the want is created for mechanical appliances to aid in the working of these heavy guns, and emphatically do I conclude with this expression of my deep conviction that whatever mechanical helps may be used, they should be of the simplest possible description. Once admit working machinery into the construction of a naval gun-carriage of such a character as to require engineering attention to keep the parts in proper working order, and you deprive the ship's gun of that simplicity so necessary to adapt it to all the trying work and exposure it is liable to. If, I repeat, mechanical aids be required to work modern heavy guns, which they will be, then let these appliances be as simple as possible, easy of application, and admitting of prompt replacement in case of need, all which considerations are, I feel confident, provided for in the plans which I have had the honour of describing to you this evening.

The CHAIRMAN: It is customary at our evening meetings to invite discussion. I hope that any gentlemen who have questions to ask will put them to the Lecturer and I must ask Mr. Cunningham to make a memorandum of them, so that he may be able to answer them consecutively. I will set the example by asking one question myself—whether this running-out tackle is applied to one side or to both sides of the gun?

Mr. CUNNINGHAM: To both sides, the winches independent of each other.

Commodore RYDER: What kind of compressors do you use?

Commmander COLOMB, R.N.: Had you more than one gun fitted in the "Minotaur?" I wish to ask also whether you witnessed the firing of your gun at sea, and to what extent of rolling?

Captain HOUSTON STEWART, R.N.: Allow me to ask, in case of the railway for transporting the projectile to the gun being injured by shot, or in case of the running-out tackle being injured by shot, what would be the position of the gun-carriage as to working the gun, and also as to loading the gun, and is there any other special arrangement for loading?

Captain PULLEN, R.N.: In working the turret, what protection from shot have you for the machine abaft the turret? Also in providing cartridges for the gun, are there boxes for every gun? and after the cartridge is out, do they still remain in the position in which we see them now, or do they go down flush with the deck?

Captain BURGESS: Suppose any portion of the chain gear were broken in action, how would you be able to work your gun by manual labour?

Admiral HALSTED: I see in the drawings the representation is given of a single turret only, or a turret of one gun, would the plan be equally applicable to a turret of two guns?

Mr. CUNNINGHAM: Yes; and now to come to the questions that have been asked. With regard to the Chairman's question. The winches are independent of each other.

Commodore RYDER: Don't you find some inconvenience from their being detached, that the gun has a tendency to jam on one side rather than the other, from one man working faster than the other?

Mr. CUNNINGHAM: It has not been found so. There is some difficulty in running in with one winch only. Then with regard to the question, "Have you more than one gun fitted in the "Minotaur?" I would say that there is only one gun on board the "Minotaur" fitted with my training gear; and one on board the "Excellent" with my training gear; and one gun on board the "Minotaur" fitted with the running-in and out gear. The next question which was asked was whether I had witnessed the firing of my gun at sea, and to what extent of roll? I have seen about 150 rounds fired from that gun. The maximum roll was 10 each way, and I believe it did reach 12; the average roll was 7.

Captain COLOMB: Was it on her last day's trial?

Mr. CUNNINGHAM: No; she was out one day and I was not in her. It was the time before.

Captain COLOMB: Because the last time they got 13.

Mr. CUNNINGHAM: I believe they got more than when I was out with her. I am only speaking from actual observation. I think they have put the average as 7 only, but she rolled 10 degrees I know. The next question was asked by Captain Stewart. In the event of the training gear being shot away, and the railway over-head being shot away, what should I do? The chain is easily replaced; it is more easily replaced than the old tackles. As to the over-head railway, I do not think it could possibly be injured, it is so well up to the beams. Supposing it is injured, you must do the best you can without it.

Captain STEWART: Is there any inconvenience from the shot travelling the railroad when the ship is rolling?

Mr. CUNNINGHAM: Hitherto it has not been found inconvenient.

Captain STEWART: Does the running-out gear enable you to control the gun?

Mr. CUNNINGHAM: It has only been used for running the gun *in* when the gun has not come in its full limits. For instance in the "Minotaur," when the gun was fired, and the ship gave a roll to leeward at the same time; the gun only came in half way, and then you want to apply the gear instantly to get the gun in.

Captain STEWART: There is no control for that particularly in the winch itself.

Mr. CUNNINGHAM: There is a side lever which I have not shown here, an iron bar, which I have provided for running out. By bearing upon this, you can stop the gun at once. But then you have your compressors as well. So you have several means of controlling the gun independent of the running-out gear. Captain Pullen asked me what protection was there for the machine abaft the turret. It is under the deck. The question was asked me, supposing that any part of the chain were broken in action, what arrangement can be made for working the gun by manual labour? There is still the train tackle. The gun is always eased out by the train tackle. The train tackle was always used on board the "Minotaur," so that you had all the gear for working the gun on the ordinary plan. But there is no necessity for running the gun out. The gun goes out by itself. The slide being on an incline, the difficulty is to control the gun in running out. It is also available for working a weather gun. The next question was whether I contemplated that the cartridge recess should always remain above deck in the manner represented here? Certainly, but not so high as this; I contemplated that it should be made of metal, and less high than shown in the diagram. It would be a fixture, and not be fitted to rise up and down.

Captain COLOMB: Is it the loose cartridge, or the cartridge in a box that is carried up?

Mr. CUNNINGHAM: The cartridge would be sent up loose, and not in a box. I propose to have a flannel becket on the top, for the finger to go into it. The boxes are about 3 feet high, for a 40lb. cartridge.

The CHAIRMAN then returned the thanks of the meeting to Mr. Cunningham for his interesting paper.

LECTURE.

Friday, March 2nd, 1866.

GENERAL SIR JOHN F. BURGOYNE, Bart., G.C.B., R.E., &c., &c., in the Chair.

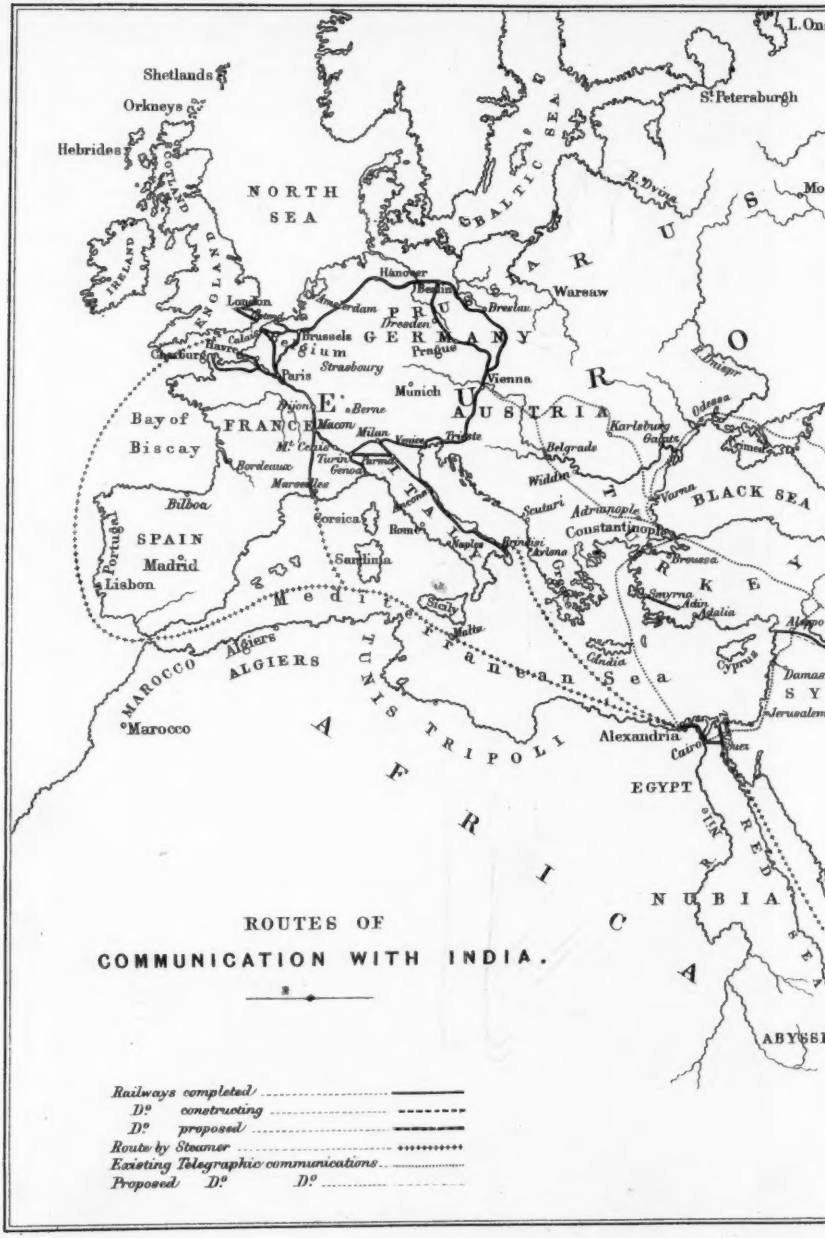
"ROUTES OF COMMUNICATION WITH INDIA."

By Captain H. W. TYLER, R.E., Railway Department Board of Trade.

CAPTAIN TYLER: The Council of this Institution have done me the honour to ask me for two successive years to lecture in this theatre on the routes of communication with India. I have ventured to accept the invitation, but not without a strong feeling that there were many members who would, with greater local knowledge, higher attainments, and more leisure for study, be better able to deal with the subject than myself.

The development of science and of steam-power has already done much to improve the communication between this country and India. For instance, the Duke of Wellington, when he was first ordered with the 33rd Regiment to the East Indies, being unable to proceed with them from ill-health, followed them in a fast sailing frigate, and overtook them at the Cape of Good Hope, and then went on with them to India. Again, on his return from India, he embarked at Madras in the year 1805 for England, and was five months on the voyage, one month of which he spent at what he called "the beautiful and salubrious island of St. Helena," destined afterwards to be the prison and the burial-place of his great rival. He almost lived long enough to see troops sent out in as many weeks by what is called the Overland route to quell the great mutiny in India

But this route from England to India is not only a way for the thirty millions of the United Kingdom, and the two hundred millions of India, to pass from one to the other, but it is a highway between Europe and Asia—between all the nations of Europe, except perhaps Russia, and all the countries of Asia. And whatever amount of traffic may exist upon that highway at present, there can be no doubt that as greater facilities of communication are afforded, an increase will occur which at the present time we can hardly contemplate.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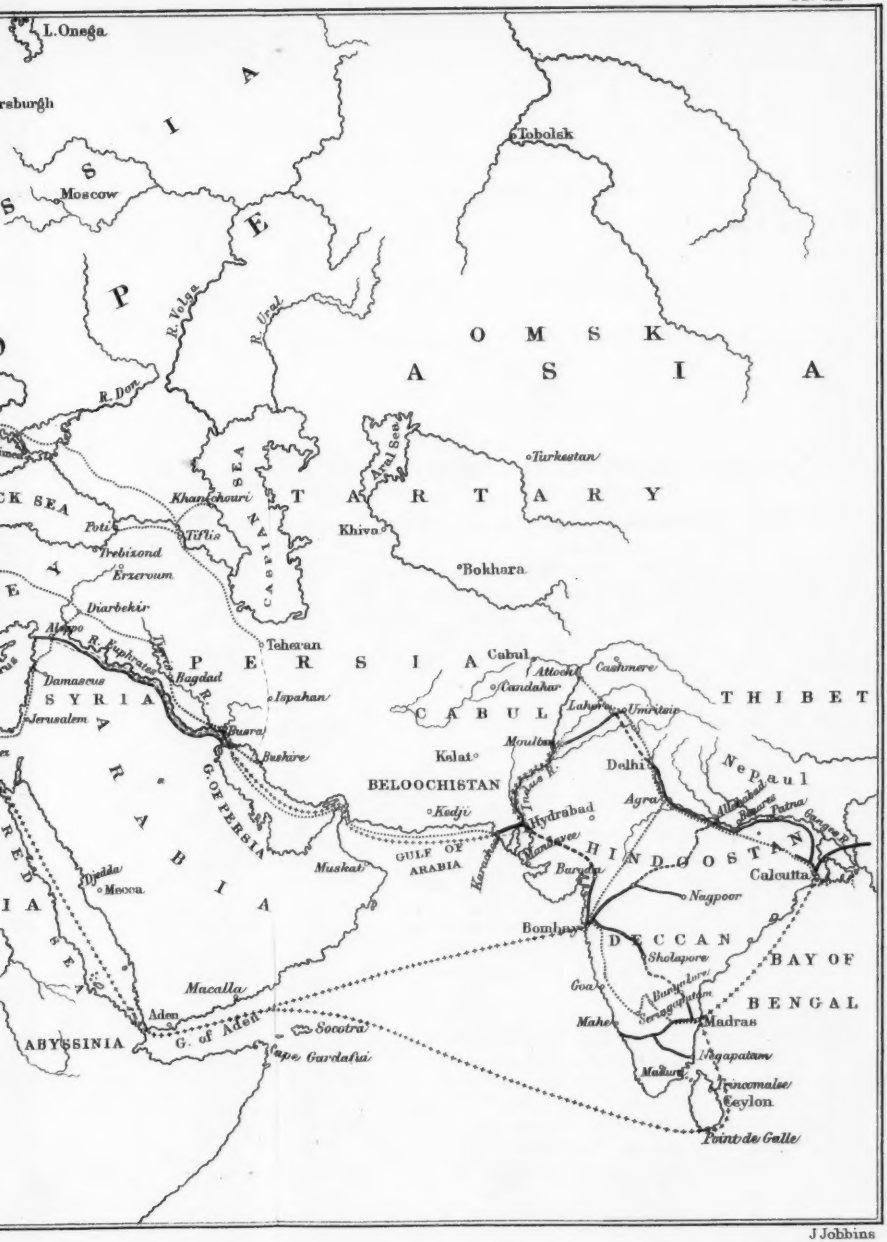
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ABYSSINIA

J Jobbins

It is my task now to show how those facilities can be afforded.

In the first place, I will ask you to allow me to quote a few statistics. They are rather *wearisome* things to an audience, but I will not give you too many of them, or more than is necessary to compare the actual traffic of 1864 with that of 1860. The figures in my hand have been taken out by my friend, Mr. H. R. Lack, of the Board of Trade, from Board of Trade Returns, and are a summary of imports and exports between the United Kingdom and France, on the one hand, and India, Ceylon, Singapore, China, and Japan, on the other.

It appears that in the year 1860 the value of the total imports from India to the United Kingdom was £15,000,000; but it rose in 1864 to £52,000,000. In 1860 the exports were £17,000,000; in 1864, £20,000,000. The former were carried in 527,000 tons of shipping in 1860, as against 731,000 tons in 1864. From Ceylon our imports increased from £2,274,000 in 1860 to £3,173,000 in 1864, while the exports to Ceylon from the United Kingdom increased from £711,000 in 1860 to £822,000 in 1864. From Singapore and the Eastern Strait settlements the imports have increased from £1,000,000 in 1860 to £2,000,000 in 1864; while the exports to those settlements decreased from £1,718,000 in 1860 to £1,230,000 in 1864. The imports into the United Kingdom from China increased from £9,323,000 in 1860 to £15,548,000 in 1864; but the exports decreased from £5,000,000 in 1860 to nearly £5,000,000 in 1864. There was very little traffic from Japan in 1860, the imports from that country amounting to only £127,000; but they rose to £1,500,000 in 1864. The imports from Egypt have nearly doubled themselves, having increased from £10,347,000 in 1860 up to £19,602,000 in 1864. I should, however, explain that the increase of imports from the East and from Egypt during those years has been owing, in a great measure, to the importation of raw cotton, in consequence of the American War, while the decrease above referred to, occurred from diminished manufacture of cotton goods. Then, again, to give an idea of the trade of France with those regions, I may state that the imports into France from the British East Indies rose from 57,000,000f. in 1860 to 117,000,000f. in 1864; while the exports from France to the British East Indies fell from 10,000,000f. in 1860 to 9,000,000f. in 1864. The imports into France from China rose from 2,800,000f. in 1860 to 21,000,000f. in 1864; while those from Egypt rose from 23,000,000f. in 1860 to 101,000,000f. in 1864.

The principal, or almost the only, articles brought from India, and through Egypt, by the overland route, up to the end of 1864, were precious stones, bullion, raw silk, and silk goods; the raw silk being worth about £2,240 a ton, and elephant's teeth about £600 per ton. But great quantities of raw cotton have since been carried along that route, and it cannot be doubted that both the number of articles and the quantity transported will, as I have already said, very much increase as greater facilities for communication are afforded.

All this merchandize, then, between the East and the West is carried by two main routes—the nine-thousand-mile route round the Cape of Good Hope, and the six-thousand-mile route by the Mediter-

ranean, a large proportion of that by the shorter route, being conveyed in the vessels of the celebrated Peninsular and Oriental Company. To show the magnitude of the operations of that company, which has been established for a quarter of a century, I may say that it has a total capital of £3,248,000, with a surplus, which is its Reserve Fund, of £458,000. The gross receipts for the twelve months ending the 30th September, 1865, amounted to £2,136,000. The insurance, wear and tear, and depreciation, for the same period, amounted, in round numbers, to £1,976,000, leaving a net profit of £159,000; and the Chairman stated at the last half-yearly meeting of the Company, that which gives a very good notion of the extent of their operations, viz., that the rise in the price of food had affected them very materially, because they had no less than "ten thousand stomachs to fill every day." The navigation of the Company for the twelve months extended over 1,500,000 miles, and they possess altogether a magnificent fleet of 63 vessels, with a Customs' measurement of 92,353 tons, and 18,270 horse-power. Some idea also may be formed of the increase of traffic which we may expect from Eastern countries if I state what is now occurring on the railways in India. There are as yet in India less than 3,500 miles of railway. The two principal lines are the East Indian Railway, running from Calcutta to Delhi, with a branch under construction to Jubbulpore; and the Great Indian Peninsula Railway, running from Bombay to Jubbulpore in the north-east, and from Bombay to Madras in the south-east. Of the East Indian Railway from Calcutta to Delhi, which has cost about £20,000 a mile, 1,200 miles are completed, and the traffic has reached from £38,000 to £40,000 a-week. The Great Indian Peninsula Railway from Bombay to Jubbulpore and Madras has only been half completed, about 624 miles being open for traffic; but that line is being constructed at the lower figure of £13,000 a-mile, while the weekly traffic upon it has amounted to as much as, and in one case has even exceeded, that on the East Indian Railway. In fact, the traffic on the Great Indian Peninsula Railway has nearly trebled itself as between some of the first few weeks of last year and the corresponding weeks of this year; and if the receipts go on at the present rate, it promises to be not only one of the best paying railways in India, but one of the best paying railways in the world.

When this line is completed to Jubbulpore on the north-east, and to the Madras Railway in the south-east, and when the East Indian portion is completed to Jubbulpore also, there will be complete railway communication between Bombay and Calcutta, and between Bombay and Madras, and these lines being main routes, Bombay will necessarily become *the* port of India. In dealing with my subject, therefore, I shall consider the two ends of my grand route as being England and Bombay. That route naturally divides itself into two parts, the one part being from England to the east of the Mediterranean, and the other part from the east of the Mediterranean to Bombay.

Of the different routes between England and the east of the Mediterranean, the first which claims our attention is that by sea from Southampton to Alexandria, which is 3,000 miles long, and which

occupies about thirteen or fourteen days. There can of course be no shorter sea passage than this to Egypt. The only question is, whether the ports of Plymouth or Falmouth might not be used with advantage instead of Southampton. There are strong opinions in the minds of many upon that point. Another question to which I shall have hereafter to refer, is that of the Suez Canal. When the Isthmus of Suez is once cut through by a navigable ship canal, there can be no doubt that it will complete an excellent sea-route between Bombay and England, by which merchandize may be carried in steamers without transhipment, and with a saving, as compared with the route round the Cape, of 3,000 miles.

The next route is that by Marseilles. The distance from London to Marseilles is 853 English miles, and from Marseilles to Alexandria 1,460 nautical miles, in all about 7 days and 18½ hours. Whatever route we take we can hardly take one which has a much shorter mileage, though we might take one, as I shall presently point out, which will be more advantageous in point of time.

The first question on that route is how we can get over, or under, the straits of Dover. One scheme has been brought forward even this year for a tunnel under the Channel—from Dungeness to Cape Grisnez. Extravagant as the idea may now appear, I have no doubt that a tunnel will some day be carried out. There are eminent engineers now working upon it. It is believed that the whole of the ground under the sea is composed, if not of chalk, of materials, at all events, which will not be anything like so tedious or so expensive to bore through, as the tunnel which is now being constructed through the Alps, though the length is 20 miles against 7½, and there might be difficulties as to water which in the Alps have not hitherto been encountered. Another scheme was brought forward this year, of employing very large boats for crossing the channel. The trains were to run from the pier to those boats, and to be ferried across in a complete state. I applaud the idea of larger boats than we have at present, for having made the passage frequently in rough weather, I can speak from experience as to the disagreeables of it; but if I am to have a big boat at all, I should prefer to walk about it, rather than to sit in a railway carriage during the passage. At the same time these large boats may be very useful, in transporting waggon-loads of merchandize for saving transhipment.

On this route occurs, also, the very disagreeable passage across the Gulf of Lyons, between Marseilles and Malta, and it is now proposed to avoid that passage by the route *viâ* Brindisi, or some other Italian port. Three years ago, the Government of Italy entered into a convention for the employment of steamers from Ancona* *viâ* Brindisi to Alexandria; in May last the railway was opened to Brindisi; and Brindisi has thus become the nearest accessible port to Egypt. If you look at the map, you will see that 638 nautical (or 734 English) miles of sea may thus be saved, by subtituting for it 651 miles additional of

* These steamers, of the *Adriatico-Orientale* Company, now run between Brindisi and Alexandria only.—H. W. T.

land-journey; and inasmuch as we may travel more than twice as fast by railway as by steamer, it is obvious that an important saving of time may thus be effected. But it is as yet undecided whether Brindisi, which is out of the line of steamers from Marseilles to Egypt, would be upon the whole the most convenient port from which to embark, and there is a break in this journey at present, where the Alps lie across the railway. The diligence takes in summer eight or nine hours, and in winter ten and a half hours, when the weather is good, for crossing the Mont Cenis; but at times, during bad weather, the diligence is not able to go at all, and at other times, as many present are no doubt aware, the journey is made in sledges. To obviate this delay in the means of communication between France and Italy, the "grand tunnel of the Alps" is now being constructed. This tunnel, which was commenced in 1857, is seven miles and a half long, of which distance headings have been driven through less than three miles and a half, while upwards of four miles remained at the latest accounts to be pierced. The whole line from Saint Michel, on this side, to Susa, on the other side, will be about 42 miles long. It is from beginning to end a difficult line, in an engineering point of view. There are many other tunnels on it besides the "Grand Tunnel," which it has not yet been thought worth while to commence. The gradients are as steep as 1 in 28 in places; and even half through the "Grand Tunnel" the gradient is 1 in 45½. The summit of this tunnel will be at an elevation of 4,500 feet above the sea, and the total cost of these 42 miles of railway will be £5,376,000.

The excavation in the tunnel is carried on by machinery, worked by means of compressed air. Outside the tunnel, and a short distance from it, there are half-a-dozen large water-wheels, by the action of which the air is compressed to a pressure of five atmospheres; and the compressed air being taken into the tunnel through a pipe, is used at the face of the excavation to work a most ingenious machine, which was originally contrived by Messrs. Sommellier, Grattis, & Grattoni, and which has now been working there for some years. There are nine jumpers working against the rock, kept in motion each by two cylinders, the one cylinder causing the jumper to twist round, and the other propelling it forward. They thus imitate the action of jumpers worked by hand, and bore holes ten, or twenty, or thirty inches deep, according to the nature of the rock. Then other holes are bored; and when a sufficient number have been made, the machine is run back 200 or 300 yards, and powder is inserted, tamped, and exploded in the usual way. As soon as the explosion has occurred, the material is thrown into waggons, and run back as rapidly as possible; and the machine is brought up again, and set to work as before.

But there are some difficulties with regard to ventilation. About 200 yards behind the machine there is constantly a dense column of smoke and the products of combustion; and in walking into and out of the tunnel you find practical experience on this point by the way in which your clothes, face, and hair are blackened. It takes as much as two days to clear the tunnel out, and purify the air, when no work is going on. It did so, at least, when I was in the tunnel last

spring. They were then progressing at the Modane end at the rate of as much as one mètre and a-half per day; but since that time they have come, as was then expected, to very hard, solid, quartz rock, and they find great difficulty in getting through that rock. I believe their progress lately has been at the rate of half a mètre a-day. There is believed to be about 500 mètres of this quartz rock, followed by compact limestone, which will, it is expected, be more easy to deal with. Looking to the quantity and quality of rock to be bored through, and to the rate at which the work will probably progress, it may be estimated that this tunnel will not be completed, perhaps, for six or seven years.

In consequence of the time which it will take to complete this tunnel, the idea has been conceived of constructing a temporary railway over the top of the Mont Cenis. There is a very good road over the mountain, along which it is proposed to lay this railway. The total elevation of the pass is 7,000 and of the mountain 11,000 feet. When Mr. Fell went three or four years ago to examine it, with the view of taking a railway over it, he found it too steep for any ordinary railway worked in the usual way, and he was therefore obliged to adopt a new system, the principle of which I will now explain. In ordinary railway working we trust, as you are aware, to the adhesion between the vertical driving wheels of the engine and the bearing rails of the permanent way, as the means by which the steam-power is applied to propel a train. And in order to get extra adhesion to take heavy loads up steep gradients, we are obliged to increase the weights of our engines, and the number of their driving wheels, in proportion to what we require. But in mounting a gradient of 1 in 12, with bad adhesion, such as you are liable to on the Mont Cenis, sometimes not more than one-tenth, or even one-fifteenth, an engine, ever so heavy, would only be able to take itself up, with perhaps a very light train. So Mr. Fell has thrown off extra weight, and made an engine partly of steel; and he has employed for extra adhesion, a central rail, laid in the centre between the other two, with horizontal wheels on the engine to bite upon it, and so pinch their way up the incline. His second engine weighs 17 tons, which, added to 24 tons of pressure between his horizontal wheels and middle rail, affords a total adhesion of 41 tons; and it will do the work, therefore, on steep gradients and slippery rails, of an ordinary engine weighing 36 or 40 tons, without being killed—so to speak—by its own weight.

Mr. Fell first tried this system,—which was patented so far back as 1830, but had never been reduced to practice,—at Whaleybridge, with the assistance of Mr. Brassey, in this country, and the experiments there were so successful, that he then constructed an experimental railway on the Mont Cenis, which has been worked now for many months with great success. About 20 minutes' walk above Lanslebourg, where the ascent of the Mont Cenis commences, he has constructed a mile and a quarter of railway, on the zig-zags of the steepest part of the mountain. The steepest gradient on it, is 1 in 12, the average gradient 1 in 13. The curves are very sharp, with a radius of only 40 mètres, or 131 feet, round the corner of the zig-zag. On this experi-

mental line, with his second engine, he has taken up a weight of 16 tons, which is equal to 50 passengers with their luggage, at the rate of 8 miles an hour; and there is no doubt he will be able to run without any difficulty for the 48 miles which he has to traverse with his railway, in four hours; whereas it takes twelve by the diligence in bad weather, and eight hours in the best of weather.

There will be nine miles and a half of covered way on the mountain, to avoid any risk from the action of snow and avalanches, and that the traffic may be worked punctually and with safety in the worst of weather. One very important element in the system, is the greatly increased degree of safety that may be obtained. The central rail, properly applied, will prevent the possibility of a train running off the line; and you may easily conceive that it is most important to have this extra means of safety round very sharp curves, and at the edges of precipices, on the slopes of the Mont Cenis. In fact, the engine wheels have on more than one occasion mounted the bearing rails on the experimental line when the permanent way was not in good order; but the action of the middle rail was sufficient to bring them on to the rails again. In running down this railway at first, it feels—so to speak—rather like sliding down the roof of a house; but the breaks acting upon the middle rail afford a powerful means, in addition to the ordinary breaks, of stopping the train; and I have seen the experimental train, travelling at the speed proposed to be employed, brought to a stand within a dozen yards on the steepest part of the slope.

Another advantage of the system is its great economy. This summit railway will be constructed at a cost of only £8,000 a-mile, in the place of £128,000 a-mile which the tunnel line will cost; and it will be constructed in two years instead of—say fourteen or fifteen years, which will probably have been expended altogether before the tunnel line can be finished. But even if a permanent line were constructed over the mountain at a cost of £20,000 a-mile, or twice and a half as much as this temporary line will cost, and if you add an extra amount to cover the working expenses, which will of course be additional in carrying the traffic of the summit railway over a super-elevation of 2,500 feet above the highest point of the tunnel line—if you capitalise that extra cost of working at the rate of 6 per cent.—you will even then save as much as £4,000,000 out of the £5,376,000 which, as I have already stated, the tunnel line will cost. But the economy is still better shown in this way;—that summit railways might be constructed over all the Alpine passes,—over the Mont Cenis, over the Simplon, over the Saint Gothard, and over the Luckmanier or the Splugen, for the same money as this one tunnel line will cost.

Many other systems have been advocated for taking trains up steep inclines, amongst which I may mention the screw system of Signor Grassi. He proposed to place under his engine, connected with the crank-axle, an Archimedean screw, which was, as it twisted round, to work upon rollers fixed between the rails of the permanent way; and the adhesion of the screw upon the rollers was intended to take the place of that between the wheels and the rails as the engine screwed itself up the incline. I may mention also the pneumatic

system, which has many advocates, both in England and on the Continent, who suppose it to be suited for very steep gradients. This system may probably be used with advantage for underground lines, of more moderate gradients, where you are obliged to have tunnels, but it is not so well adapted for very steep gradients on account of the loss of power, and therefore greater expense of working, under increased pressure.

Then, again, there is the system of Signor Agudio, which is in great favour with the Italians, and is entirely a system of ropes. He places a stationary engine at the top of his incline, and a second stationary engine at the bottom. He has one double endless rope passing between them, which is continually worked, the ascending portion by the upper, the descending portion by the lower engine; and a second rope between the two portions of the endless rope, called the cable of adhesion, which is fixed at the top and weighted at the bottom of the incline. He employs, also, a machine which he designates as the "*locomotive funiculaire*" at the head of his train. The endless rope works upon this "locomotive," and turns certain wheels upon it, the rope running about two and a half times as fast as the "locomotive" goes with its train up the incline. The wheels turn certain drums upon the "locomotive," which have two and a half turns round them from the cable of adhesion; and by the rotation of these drums in the cable of adhesion, the "locomotive" machine winds itself and draws its train up the incline.

There would be serious difficulties in the application of this system to very high mountain passes, in consequence of the difficulty of working when the ropes are enveloped by snow and ice; and you have not the safety in such a rope system that may be derived from the central rail. Another important point is that under the system of Signor Agudio the very sharp curves which are necessary on the railway over the Mont Cenis are impossible.

Another route which we must now consider is the Trieste route. This is 260 miles shorter by sea, but 369 miles longer by land than the route by Marseilles; and, therefore, it may be rather a quicker route. But now that railways have been constructed down to Brindisi, few people will be inclined to embark at Trieste or even at Ancona.

Two other routes have been proposed which are, perhaps at present, hardly worth considering. The one is from Belgrade to Constantinople, which will be a difficult railway route to construct, and the other is by Avlona, opposite Brindisi, and so by land to Constantinople. Another difficulty about both of those routes at present is, that even when you reach Constantinople, you have a very difficult country again to cross through Asia Minor; and it will probably be some time before railways are made through those countries.

The route, then, by Italy is the quickest route which we have any immediate chance of using. The railway over the Mont Cenis will probably be brought into use in the course of next year; and I may say that it is under the consideration of Government to send the Indian mails by Italy if they can make proper arrangements for it, as regards the railways and harbours.

I now turn to the other side of the map, to the route from the east of the Mediterranean to Bombay.

The sea route from Suez to Aden and Bombay is about three thousand miles long. The navigation is difficult, and at times very disagreeable. By way of improvement to this route, the Suez Canal is, as every one knows, now being constructed. M. Lesseps proposes to make across that isthmus a ship-canal seventy-two miles long. He neglects the routes taken by the Pharoahs of old, which were connected with different branches of the Nile, and goes straight across from Port Said in the Mediterranean, to Lake Timseh (which was dried up until very lately) half way, and so on to Suez. The channel of this grand ship-canal is to be twenty-six feet deep, one hundred and ninety feet wide at the top, and one hundred feet wide at the bottom. He has already constructed a *rigole*, or small canal, about six feet deep from Port Said to Lake Timseh. The part from Lake Timseh to the Red Sea has hardly been commenced, or at all events very little has been done upon it. But a sweet water canal has been constructed from a place called Zagazig, from a branch of the Nile towards Lake Timseh and near it, and from thence nearly parallel to the line of the permanent canal to Suez. This sweet water canal is nearly finished, sixty feet wide and six feet deep; but it is about nineteen feet higher than the salt water canal; and he has by means of locks connected the two together. He is able thus to convey boats, by using the rigole to Lake Timseh, and the sweet water canal to Suez, all the way from the Mediterranean to the Red Sea. There is little doubt, I think, that the great energy of M. Lesseps, and the credit of the French Government, who are backing him up, will lead to the completion at *some* time of this canal. But there are still great difficulties to be encountered on parts of it. The foundations are in some places very bad, and as fast as he digs out the mud and sand, so fast does the excavation fill up again. He proposes to make walls all along the sides; but to get foundations for those walls will be exceedingly troublesome, and they will take a great deal of time and money. He has also, which are less difficulties, very high hills of sand to excavate. He is evidently going about this in a very energetic way, for I heard not long ago of a hundred steam-dredges having been ordered to Egypt for the excavations. With these he intends, no doubt, to compensate as well as he can for the want of the forced labour, of which at first he had the advantage, but which he has since been deprived of. One gentleman told me the other day that he had himself seen twenty of these steam-dredges landed from a ship that was obliged to put back into Falmouth Harbour in distress. They were constructed to work to a depth of about twenty feet, with portable engines, so that when the dredges had done their work the engines might be employed for other purposes.

There has been much political feeling on the subject of this canal, which has been supposed to be hostile to British interests. But it will certainly, if it is completed, be of much more use to us than to any other nation; and I, myself, think that we ought to feel very much obliged to M. Lesseps and the French Government, for expending

so much money in the hope of making it for us. As long as we have command of the sea it will be entirely at our mercy at both ends; and it will, if it is completed, give us a most excellent ship route to the East, by connecting our Southampton and Mediterannean route with our Suez and Bombay route. But it is a question whether it will ever be of much use to sailing vessels in consequence of the difficult navigation of the Red Sea.

The Egyptian Government also have an idea of making a railway 1,700 miles long, from Suez to Cape Guardafui. Such a railway may be important for Egypt, but I doubt whether it would ever be of much avail for British traffic, because it is a long line, about twice as long as another and a better, to which I shall have directly to point; and because it would bring us out at the wrong side of the Arabian Sea.

The next and last, but by no means least important route which I have to consider, is that by the Euphrates Valley. The first discoverer of that route may fairly be said to have been Alexander the Great, who marched from Egypt to the Valley of the Euphrates, and so on to Bagdad, wintered at Bokhara, conquered Persia, took possession of India, sighed for more worlds to conquer, and returned with the remnant of his sickened army, after a march of nearly 20,000 miles, to die in the Lamlum marshes. Many others have since followed or attempted to follow his example; and it is well known that the Great Napoleon, when he went to Egypt, had an idea of doing the same,—of wresting India from us, and conquering the East; and he would, no doubt, have endeavoured to carry out the project, if we had not nipped it in the bud in Egypt.

This route was reconnoitred by General Chesney in 1830, when he made a most enterprising and interesting voyage of 700 miles, with an interpreter and a servant, down the Euphrates. He gave us a highly valuable lecture on the subject, in 1857, at this Institution; and the map before you on the wall is the same which he used on that occasion, though a little altered. I daresay many who are present will remember how he told us of his great enthusiasm; how he feared, when he saw a flight of birds in the distance, that it was the smoke of a steamer; and how he thought that the route about which he was so anxious, and which he intended to introduce to the world as his own, had been discovered and utilized by some previous explorer. £20,000 was afterwards voted by Parliament for a regular survey of this route, which was made, under General Chesney's command, by Sir John Macneil and others. I have been glad to learn recently from General Chesney, that the Treasury have authorized the publication of another volume of his proceedings. The result was a proposal to make a harbour about three miles to the south of the Orontes river, as shown in the diagram before you; and they chose, as the best route for a railway, that by Antioch and Aleppo, down the Euphrates, on to Bagdad, and so to the Persian Gulf. The harbour was to cost £350,000, and the railway about £6,000,000. They found that the route would be an easy one. There were a couple of bridges required over the Orontes river, and some cuttings between the Orontes and Aleppo; but the line from Aleppo down to the Persian Gulf was stated to be principally

over flat, dry, level ground, that would present every facility for a railway. There is a steamer already running between Basrah and Bagdad. The navigation through and from the Persian Gulf would be far superior to that from Suez by the Red Sea; and there remains the possibility of ultimately completing the communication by railway from Bagdad *vid* Kurrachee to Bombay.

By the adoption of this route we should save about 800 miles of distance, and several days of time. There can be no doubt that it is a most important route, in a strategical as well as in a commercial point of view, for ourselves, as a nation. We should have the command by sea of the two ends of it, in the Mediterranean and in the Persian Gulf, and we should be able by its aid to connect our forces in Europe more intimately with our armies in Asia—to unite them for any operation intermediately between Great Britain and India, and to reinforce Great Britain from India, or India from Great Britain, within a fortnight, whenever we required to do so.

Mr. Bancroft, in a speech that did not exhibit much delicacy, the other day in America, accused us, though I do not know that the accusation was worth much, of having constructed a chain of forts from Madras to Ceylon. But what we really want, in a military point of view, is a chain of forts along the route of the Euphrates Valley from England to India. There is an idea that we should meet with great difficulty from the inhabitants in making such a line; but it is said by others, on the contrary, that as Englishmen we should, on the whole, be well received, while if the Turks attempted themselves to construct the railway they would meet with great opposition—that it would be looked upon in the one case as an undoubted advantage; in the other as another instrument of oppression. Just as the Turk who wants food on that route often finds it difficult to procure any, whereas the Englishman, having money and being ready to pay, is surrounded by plenty.

The ultimate route, then, that we should look forward to, practically, at the present time, is that through Italy and by the Euphrates Valley. By this route we may hope to go some day about 5,000 miles in a fortnight.

In concluding, there is another most interesting feature to which I would direct your attention. Every reader of prophesy must regard a map of this sort with great interest, when he remembers the predictions that are not yet fulfilled. One can hardly look at it, indeed, without observing that it points in both directions, from the east and from the west, towards the Holy Land. We see and know that the Jews have been and are now scattered from that promised land among all nations; and judging from the completeness with which the prophecies with regard to their banishment have been fulfilled, we may be quite sure of the punctuality with which those prophecies will also be literally fulfilled which speak so plainly of their re-instatement. May we not, therefore, indulge the hope that in laying out and establishing these routes between England and India, we are really doing something more—that we are contributing in an important degree to fulfil the designs of Providence. Who can read the passage

in Isaiah, "Every mountain shall be a highway for my people," without thinking of all the summit railways and grand tunnels that are in contemplation? We are surely in some measure assisting to pave the way for the return of that people to the land to which they will "fly ere long as a cloud, and as the doves to their windows," bringing their silver and their gold with them, and which land they are destined on their conversion to inhabit and to enjoy in future generations.

The CHAIRMAN: This is a subject of very considerable interest, and presents some little difficulty. But we are, I think, greatly indebted to Captain Tyler for the insight he has given us into the subject as a whole, and also to the various details. I would, therefore, propose that we give him our best thanks.

A. F. RIDGWAY, Esq.: Having been associated with Mr. Waghorn in assisting to develope the importance of the communication with the East Indies, I trust I may be excused, as an old pioneer of the overland route, for addressing you on this important occasion. It is a matter of such vast importance to every person here, as I know it is to every one, military, naval, or civil, that I intrude myself upon you to say how thankful I am, and how thankful we ought all to be to the lecturer for having taken so much trouble in explaining to us the facilities of going backwards and forwards between England and India.

At the first establishment of the Peninsular and Oriental Company I made a table (see Appendix) of the time occupied in conveying the mails to China, Bengal, and elsewhere. I have that table somewhere; and I will find it and send it to Captain Burgess that he may see if it is of any use to publish it in the Report of this Meeting. Lord William Bentinck read an extract at the same time from a Report of the Marquis of Wellesley, the Governor-General of India, stating that he had been eight months without a particle of intelligence from England. Mr. Waghorn told me he would never rest till he brought the mail from Bombay to London in 25 days, and that I should see it performed in 15 days before I died. His words as regards himself were true, my days are nearly numbered, and my memory is failing me; still I am of opinion that the Beyrout route across to Bagdad and Bombay is the route to be taken, if it can be accomplished. The difficulties are, the managing of various powers and the ignorance of the persons with whom we have to contend. Persons who have children to go and seek their fortunes in the world, ought to study this important subject, and do what they can to bring about a more speedy communication with India than now exists. With these remarks I conclude with joining most cordially in the vote of thanks to Captain Tyler for the very interesting lecture he has given us on this occasion.

APPENDIX.

TABLE showing the Time occupied in the Transit of the Mails overland to India 1837 and 1838.

The Mail Left London.	The Mail Left Falmouth.	By the Steamship.	Arrived at Alexandria.	Left Suez for India. By the Ship.	Left Suez for India. Date.	Arrived at Bombay.	Arrived at Calcutta.	Days	Arrived at Madras.	Days	Arrived at Ceylon.	Days	Arrived at Canton.	Days	Number of days from London to Bombay *vid* Falmouth.	Number of days from London to Bombay *vid* Marseilles.
1837.	1837.		1837.	Skimmer	1837.											
*Jan. 2	Jan. 4	Blazer.....	Jan.		Feb. 6											
Feb. 3	Feb. 5	Volcano	Feb. 28	Hugh Lindsay S	Mar. 4	Mar. 30	...		...		April 15	69	...		55	
March 1	Mar. 3	Hermes	Mar.	Futty Hulbury		June 24	...		...		...		...		115	
April 3	April 5	Firefly.....	April 24	Emily	April 28	,, 30	...		...		...		...		88	
May 1	May 3	Volcano	May 27	Palinurus.....		July 12	...		...		...		...		72	67
June 1	June 3	Hermes	June 21	Hydross from Judda		Aug. 12	...		...		Aug. 26	84	...		72	
July 1	July 3	Blazer	July 21	Euphrates	July 24	,, 16	...		...		...				46	
†Aug. 1	Aug. 3	Volcano	Aug. 26	Atalanta.....S	Nov. 1	Nov. 21	...		...		...		1838.	187	112	
Sept. 2	Sept. 4	Don Juan ...	Sept. 27										Feb. 6	155	80	
,, 30	Oct. 2	Ocean	Oct. 25											127	52	46
Oct. 28	,, 30	City Londonderry	Nov. 22	Hugh Lindsay S	Nov. 29	Dec. 21	...		...		...		...		54	
						1838.										
Nov. 25	Nov. 27	Braganza ...	Dec. 23	Berenice.....S	Dec. 30	Jan. 21	...		...		...		...		57	47
Dec. 23	Dec. 25	Emerald Isle	1838. Jan. 17	Atalanta.....S	1838. Jan. 27	Feb. 21	...		...		...		...		60	47
1838.	1838.															
Jan. 20	Jan. 22	Tagus	Feb. 14.	Hugh Lindsay S	Feb. 21	Mar. 24	April 6	76	...		1838.				63	58
‡Feb. 17	Mar. 5	Iberia	Mar. 25	Atalanta.....S	Mar. 30	April 17	May 1	59	Apr. 27	55	May 27	85	...		59	43
Mar. 3															45	
Mar. 17	,, 19	Braganza ...	April 15	Berenice.....S	April 21	May 9	,, 22	65			...		...		53	43
April 14	April 16		May 9	Atalanta.....S	May 19	June 4	*ab*, June 16	63			...		...		51	39
May 12	May 14	Braganza ...	June 6	Berenice.....S	June 13	,, 30	July 14	63	July 8	57	...		...		49	45
June 9	June 11	Iberia	July 4	Palinurus from Tor	July 15	Aug. 18					...		...		69	63
July 7	July 9	Royal Tar ...	Aug. 1	Mahée	Aug. 5	,, 25	Sept. 3	58			...		...		49	
Aug. 4	Aug. 6	Tagus	,, 29	Euphrates	Sept. 7	Oct. 26	Nov. 5	93			...		...		83	72
Sept. 1	Sept. 3	Do.	Sept. 26	Berenice.....S	,, 30	,, 20	...				...		...		49	44
,, 29	Oct. 1	Do.	Oct. 24	Atalanta.....S	Nov. 1	Nov. 25					...		...		57	51
Oct. 27	,, 29	Braganza ...	Nov. 23	Hugh Lindsay S	,, 30	Jan. 1									66	56
§Nov. 24	Dec. 3	Do.	Dec. 25	Berenice.....S	Dec. 31	,, 19									57	
			1839.													
Dec. 22	,, 24	Tagus	Jan. 17	Atalanta.....S	Jan. 31	Feb.										

* Wrecked, and the greater portion of the Mails lost.

† These three Mails went on from Suez together; the two former were detained in consequence of an accident to the machinery of the Berenice, on her voyage from Bombay to Suez.

‡ Taken out by the "City of Londonderry" on the 19th February, which vessel put back, leaky, 28th February.

§ Taken out by the "Iberia," which put back to Penzance by stress of weather, with loss of rudder, on 1st December.